THE RUBBER AGE

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VOL. X OCTOBER 25, 1921 No. 2

Drying with Moist Air

By Arthur B. Stonex, Ph.D.

Eastern Representative—Hunter Dry Kiln Company

To those not intimately familiar with certain forms of present day industrial drying, the title of this paper, "Drying With Moist Air", may seem in the nature of a paradox or a contradiction of terms, for, obviously, moisture is the antithesis of dryness, and so to dry with moist air may at first blush seem as preposterous as to refrigerate with warm air.

But drying with moist air will not seem quite so insane a procedure when it is remembered that in nature one never finds air that is not moist, and every one knows that a vast amount of drying, as of soil and vegetation, is constantly going on in nature. Indeed, in many industries where the drying of materials or finished products is necessary, so-called natural drying is regarded as the ideal kind of drying. Clay products, lumber, leather, hay, tobacco, fruits and vegetables are but a few of the products of factory and field that are still dried largely and often most satisfactorily under so-called natural conditions. And they are all dried in moist air, for air is always moist at the temperatures found at least within the temperate and tropic zones of the earth.

Degree of Moistness Variable

The degree of moistness, however, of course varies greatly with the locality, the season, and the temperature. In this climate, the relative humidity of the air is seldom under 50. There is so prevalent a misunderstanding of some of these facts, and even of what is meant by degree of moistness, or relative humidity, that it may be justifiable to explain some of these conditions and terms carefully even to an audience composed probably chiefly of technically trained men and women.

In the first place, the degree or percentage of moistness of the air, or what is called its relative humidity, is not the measure of the moisture content of the air. That is, a relative humidity of 50 does not mean that the air is half full of moisture—either in volume or weight. Moreover, the capacity of air to hold moisture varies enormously with its temperature; it approximately doubles its capacity with every increase of 27 deg. F. For example, at 67 deg. F. air can hold twice the amount of moisture that it can hold at 40 deg., and at 94 deg it can hold four times as much as at 40 deg. This explains in part at least why we "feel" the humidity so much more in summer. There is four times as much humidity to feel when the temperature is 97 deg ,than when the temperature is 40 deg. even though the *relative* humidity is the same at each temperature.

Because of this fact it might at first seem that the relative humidity of the air would ordinarily be higher in the winter than in the summer, for with the same amount of moisture the relative humidity of the air would at 40 deg. be four times greater than at 97 deg., and it might seem also that at any temperature above freezing there would be approximately the same amount of moisture available for the air in the winter as in the summer. Actually this is not the case. The average relative humidity for the winter months in this climate is much lower than for the summer months. The chief cause of this phenomenon is another elementary factor of great importance in both natural and artificial drying.

The air cannot take up or absorb moisture in liquid form. Water must be transformed into vapor before it can be *evaporated,* as the word itself implies. Vaporization of water is in turn dependent on its temperature. There is some vaporization even at 32 deg., but it is only from approximately 90 deg. to 212 deg. that vaporization is appreciable. Therefore, in the heat of the summer a vastly greater quantity of the surface moisture of the earth is rendered available for absorption by the air than in the winter, and this factor more than compensates for the greater capacity of air to hold moisture at summer temperatures.

With this explanation, therefore, it will be realized, as doubtless it was by many of you before the explanation, that drying with moist air is neither a paradox nor an impossibility; that, in fact, no natural drying ever takes place otherwise, for air at the temperatures of most of the surface of the earth is always more or less moist.

But on a program of an exposition of chemical or any other industries, it may be assumed that any drying and evaporating to be discussed presumably has to do with the so-called artificial drying usually found in industry. Further, those who have had practical experience with drying, from clothes on the line to some of the highly hygroscopic materials and products of chemistry, may be saying that even if moisture is always present in air at natural temperatures, its presence is only a necessary evil, so far as drying goes, and that the less moisture there is in the air, the more rapid and satisfactory is the drying. Hence the title of this paper may still seem paradoxical if it is meant to imply, which—as a matter of fact—it is, that moist air is so desirable for the drying of at least some materials that it is artificially produced and maintained in certain systems of industrial drying, as that installed by the company of which the speaker is a representative.

The Principle Illustrated

To understand fully the principle governing this practice it is only necessary to bear in mind some of the natural phenomena already described and to take into consideration some of the chemical and chiefly physical characteristics of various materials that must be dried as part of industrial processes. In fact, it is not necessary to go to the artificial conditions of industry to find illustrations. A clay field or road will serve as well.

The rapidity with which such soil will dry out after a soaking rain depends upon one or all of several factors. If the air is still practically saturated, that is, if it holds nearly all the water vapor it can hold at its temperature, or in still other words, if it has for example a relative humidity of 95 at a temperature of 90 deg., then clearly it can absorb very

little moisture from the soil. Again, if the air is comparatively still, it will absorb less moisture than if it is moving, whatever its relative humidity, for the air that has absorbed its full moisture load must be constantly replaced by drier air. But even if there is a good breeze and the relative humidity is low, the soil will not give up its moisture rapidly if the temperature is too low to vaporize rapidly the moisture in

EXTERIOR VIEW OF DRY KILN

the soil. Hence possibly the most important factor of all is the temperature, for any increase in it will both accelerate the vaporization of the moisture of the soil and increase the capacity of the air for holding and carrying moisture.

Therefore, the first and most important step in artificial drying has been and is to increase the temperature in the room where drying is to take place, although this step is usually accompanied by provisions for accelerating the circulation and displacement of the air in the drying chamber. It might be noticed in passing, moreover, that such increase in temperature in itself tends to accelerate the circulation of air by creating differences of temperature between the chamber and the room in which it stands, or the outdoors.

Temperature Limitations

There are, however, limits beyond which the temperature cannot be raised, in most cases far below the temperatures producing combustion or other destructive change, and this is true whether the material be vegetables or lumber or rubber or such a non-combustible and practically indestructible material as clay.

Let us take again the familiar case of a clay road. If after a long hard rain, the sun comes out hot,and a stiff breeze springs up, the surface of the road will dry very rapidly. The moisture on the surface has been quickly vaporized by the heat, and the heat has increased the capacity of the air to hold moisture to such an extent that, with the rapid displacement of the air, the vapor has been almost instantly absorbed and carried off. With the rapid elimination of the moisture and the consequent shrinkage of the clay, the road will soon have a covering almost as tough and hard as dried skin, and broken up into large irregular flakes.

But if one of the flakes is removed, as by the toe of a bare foot boy in search of fishing worms, it will be found that the soil beneath is almost as wet as the surface was at the end of the rain. The vaporization and absorption of water has taken place almost exclusively at the surface, and the diffusion of moisture from the surface to the air has gone on so much more rapidly than from the interior to the surface that there has been great irregularity in the shrinkage of the soil—with the consequent checking, cracking, and flaking of it. Further, the diffusion from the surface has been so much more rapid than to the surface that an almost impervious film or coating has been formed before any appreciable amount of the interior moisture has been removed. The effect of continued heat will be to harden still further this surface coat, which will prolong indefinitely the elimination of the moisture an inch or two beneath the surface.

Now precisely the same will happen whether the clay be the clay of a country road or the potter's clay which has been molded into expensive table ware, heavy sanitary ware, or high voltage insulators—to any of which products cracking or breaking due to irregular shrinkage is ruinous. And if any moisture has been imprisoned by a too rapidly drying and contracting surface, it will turn into steam and fracture the product when subjected to the intense heat of the firing kiln.

In addition to this shrinkage and closing of the surface pores as in such materials as clay, an actual film or skin is formed on many products by the hardening of resins, albumens and similar substances on or near the surface when the elimination of moisture from the surface, especially under heat, is disproportionately rapid to the diffusion of moisture from the interior to the surface. This phenomenon, common to fruits, vegetables, rubber and many other products, and sometimes called surface drying, or skin drying, or case hardening, will also, of course, prevent the drying out of the interior, and in the case of lumber will also result in destructive checking and cracking.

Problems in Textiles

Certain yarns and other materials and products of the textile industry present a somewhat analagous problem in that uniform but incomplete drying is desired. For example, the yarn can be spun advantageously only when its moisture content is, we will say, ten per cent of its weight. But, obviously, this moisture must be uniformly distributed throughout the mass to secure the desired end, which will not be the case if the surface has been much more rapidly and thoroughly dried than the center of the skein.

In all of these illustrations of what may be called surface drying, it is clear that the trouble is caused primarily by too high a temperature, for it is seldom that the velocity of circulation can cause it with air at anything like natural temperatures and relative humidity. But we have previously seen that an increase of temperature above the outdoor normal ranges is essential to rapid drying because of the necessity of vaporizing the moisture to be removed. So increased temperature is at the same time necessary and injurious. This paradox has been the most serious problem to solve in the artificial drying of such materials and products as have been mentioned.

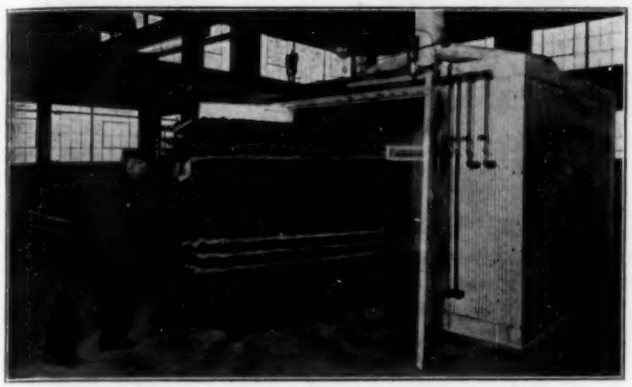
The usual solution has been to determine for any material the temperature at and below which surface drying with any of its attendant injuries or disadvantages will not take place, and to maintain in the dry room that temperature as a maxi-

VIEW OF INTERIOR OF DRY KILN

mum with the most rapid practicable movement of the air. This has been an expensive solution. Such temperature may not, for example, be sufficient on a humid day to increase the absorptive capacity of the air enough to enable it to carry off what vapor may come to the surface of the material, or sufficient to vaporize quickly the water in the material. The result is slow drying, which means serious loss—not only of time but of heat, for low temperatures require a greater

expenditure of heat to evaporate a given amount of water than high temperatures. (1)

Clearly, a better solution, if possible, would be to increase the temperature of the air in the dry room, and hence of the water to be vaporized in the material, without increasing the capacity of the air for holding moisture and hence the rapidity of the absorption. The increased absorptive capacity of



RUBBER ENTERING KILN PREPARATORY TO DRYING

the air is only indirectly due to the increased temperature; that is, the increased capacity is rather the result of the decreased degree of saturation of the air. This may be more clearly stated as follows: Saturated air, that is, air with a relative humidity of 100, will not absorb moisture—whether at 200 deg. F. or 100 deg. F.; and so far as we know, air the moisture content of which is 10 grains of water vapor per cubic foot less than its moisture capacity will not absorb those 10 grains any more rapidly at 200 deg. than at 100 deg. The solution of the problem, therefore, is to find for a given material not the maximum temperature, but the minimum degree of saturation or relative humidity at and above which too rapid surface drying will not take place at the highest temperature the character of the material and profit will otherwise permit, and to maintain that temperature and, as long as necessary, that relative humidity.

By raising the temperature, the vaporization of the water in the material is hastened, but by keeping the relative humidity of the air sufficiently high, the air will not absorb the vapor coming from the surface of the material any more rapidly than at a lower temperature. Indeed, with certain materials it is desirable, and with proper humidity control it is possible, to prevent any surface drying until the stock has become uniformly and sufficiently warm and vaporization has begun throughout the mass.

The Case of Rubber

The result of this simultaneous opening of the throttle and putting on of the brakes, paradoxical as it may sound, has resulted in astonishing savings in the time, the space, and the heat required for the drying of certain materials. Crude rubber is an illustration. It tends to surface dry and form a surface film preventing interior drying at temperatures much in excess of 95 deg. F. In the ordinary dry room it has taken at this temperature an average of about three weeks to dry thin sheets of washed rubber, although this time could be reduced—especially in dry weather—by maintaining a rapid circulation of air. It has been found, however, that with a relative humidity of as low as 30 to 35, which of course is much lower than is practically ever found outdoors in the central and eastern parts of the United States, most crude rubbers can stand temperatures in excess of 170 deg. F. without surface drying or coating or other undesirable effects, and at these conditions such rubber in large quantities and in small space can be thoroughly dried in from five to twenty hours. It should be borne in mind, however, that in order to maintain even as low a relative humidity as 30 at a temperature as high as 170 deg. provision must be made for supplying continuously to the air in the drying chamber very great quantities of water vapor in regulated volume; in a room large enough to hold approximately 4000 pounds of wet rubber an average of more than 30,000 grains of water vapor would have to be supplied per minute.

There are other materials in the drying of which equally great economies have been and apparently can be realized by utilizing this principle of drying with a minimum relative humidity and hence at a higher temperature than would otherwise be possible. How many such materials there may be is as yet unknown, for the application of the principle is still in its infancy. It is probable that among the materials and products of the chemical industries many such are yet to be found. So little experimenting has been done in the field and so many different combinations of temperature and relative humidity are possible, with markedly different results that the possibilities of such a system should be considered in plans for the drying of almost any material, and not only the possibilities of reduced time, space and cost, but of improved product.

Quality Improved by Drying

Indeed, improved quality bids fair to be a much more important result of drying with a comparatively high relative humidity than saving of time. In general it may be said that besides the prevention of destructive surface drying, the maintenance of such relative humidity results in more uniform drying of any material, and that the effects of any temperature above 100 deg. appear to be less severe in a comparatively moist air—just why, is not always quite clear. Many materials have a better texture or show improvement in other physical characteristics; some are softer, some more pliable, some are tougher, some are of better color, depending on the product. In still other materials the benefits are even more striking.

Again, rubber is a good illustration. Crude rubbers dried with a fairly high relative humidity at temperatures higher than 110 deg. F., above which the Hunter Process patent obtains, show frequently an actually greater tensil strength than at temperatures below 110 deg. F. They have greater plasticity and hence are much easier to handle on the mills and in subsequent manufacturing processes. Possibly most surprising of all, rubbers dried at the higher temperatures with such relative humidity seem not to undergo the oxidation characteristic of other air-dried rubbers. Although this result may be partly due to the greatly reduced drying time, the probable explanation is that the presence of water vapor prevents or retards oxidation. (2)

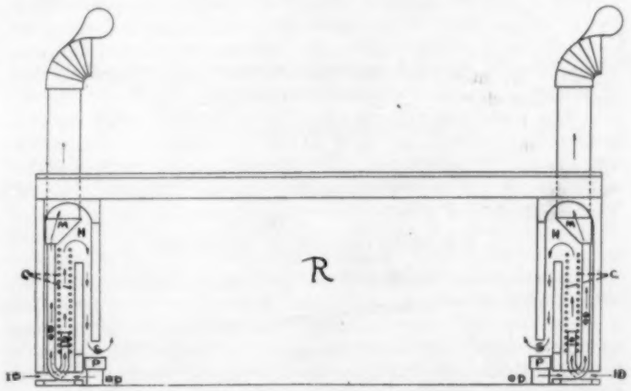


DIAGRAM OF KILN SHOWING METHOD OF OPERATION

Certain results in the drying of pigments are difficult to explain by any of the above hypotheses. It has been found, for example, that delicate colors subject to change of tone above a given temperature can be dried without such change at temperatures 40 deg. to 50 deg. higher, provided a sufficient minimum relative humidity is maintained. In such case,

(Continued on page 52)

(1) E. Hausbrand, *Drying by Means of Air & Steam*, translated by A. C. Wright, London, 1912, Table 2, pp. 22-25.

(2) Journal of the Society of Chemical Industry, London, July 31, 1920, p. 251-t, Article by H. P. Stevens.

Practical Plans for Medical Supervision in Rubber Plants

By Dr. Robert S. Quinby

Service Manager, Hood Rubber Company, Watertown, Mass.

It is a pleasure to preface these remarks with the statement that the rubber industry occupies a position well to the forefront in the progress of industrial medicine. A recent report of the National Industrial Conference Board indicates that the per capita amount spent on medical supervision in the rubber industry is well above the average of all industries. In the nine rubber manufacturing plants included in this investigation, the average yearly per capita amount spent was $5.41, as against an average of $4.43 in the other industries reported. I have been in personal contact with a great many of the industrial physicians in the rubber industry and know that they are doing a type of medical work which demands high recognition.

Points for Consideration

In considering plans for medical supervision, we may do so under the following three headings:—

I. Physical equipment.
II. Personnel.
III. Functions.

Conditions in different plants are so variable that it is needless to attempt to definitely suggest the physical equipment, but I would like to point out several important features in this connection. It is of primary importance that the plant dispensary be so located as to be easily and quickly accessible to all parts of the factory. In a relatively small plant, one dispensary centrally located is sufficient, whereas in large plants it has been found desirable to have several branch dispensaries so located as to be easily accessible to all workers. Frequently a person will neglect or delay treatment because of the inconvenience or loss of time necessary to go to the hospital, and the most obvious way to eliminate this condition is to so locate the dispensary that it will be convenient to all the workers.

A frequent mistake is made by having a dispensary too elaborate. A workman often feels hesitant and uncomfortable to visit a medical department which gives an appearance of being "highbrow". Cleanliness and all requisites of good medical work may be obtained without any extra frills, and I would warn against needless expense and frequently bad effects of unnecessary physical equipment. We are apt to fall into the same error in connection with drugs and surgical instruments. Relatively few standard drugs and instruments are all that are necessary. This economy will meet with the approval of the management as well as patients who are treated.

Personnel Depends on Conditions

The personnel of an industrial medical department will vary again with conditions. In the beginning, a nurse and a doctor on call were in most cases all the staff considered necessary, but with the development of industrial medicine, the desirability of full-time medical supervision as well as nursing service has become recognized. I believe that a plant employing 500 or more people justifies one full-time physician. The ratio of doctors to employes in larger plants should probably be an additional physician to each 1500 workmen. The number of nurses required will vary with the functions attempted in different medical departments. If nurses are used to visit absentees as well as to take care of hospital routine, it will be necessary to have more, but I believe that ordinarily one nurse to each 1000 employes is a fair ratio.

Before leaving the subject of medical personnel, I would like to emphasize the fact that a "cheap" doctor or a "cheap" nurse is a very poor investment. A doctor and a nurse who have been successful in private practice, everything else being equal, will be successful in industrial practice, and while we are able to deal more directly and perhaps exert more authority in a factory than we can in private practice, we should be extremely careful not to exercise needless authority, and should remember that the success of industrial work requires as much courtesy, care, and skill as does private practice.

First-Aid Treatment

The question of delegating first-aid treatments to foremen or workmen instructed in the rudiments of such work will depend upon conditions, but in general it is not desirable. A competent physician or a trained nurse with years of experience is sufficiently prone to have poor results without increasing this liklihood by intentionally placing the work in the hands of those comparatively unskilled. In the long run such procedure will prove to be false economy.

An adequate program of health supervision should assume the following functions:—

I. Physical examination and necessary reexamination of applicants and those already employed.
II. Dispensary treatment of sicknesses, accidental injuries, and in many cases dental, ocular, and other conditions.
III. Supervision of factory sanitation and elimination of disease hazards.
IV. Home nursing and medical supervision of such cases as may seem advisable.
V. Education in matters of health and personal hygiene.

Physical examination forms the foundation of any well-developed program of health supervision: it is the inventory of health conditions; it is the basis of a preventive and constructive industrial health program. Until a very few years ago physical examination of workers was looked upon by the majority of industrial managers as a questionable undertaking, but at the present time, at least in most of the larger industrial plants, it is a well-recognized part of both employment procedure and medical supervision.

Percentage of Physical Defects

Consider for a moment the physical defects we may expect to find in any given group of individuals applying for work. Our experience has shown the following approximate percentages of some of the more important defects:

Grossly defective dental conditions	40 per cent
Grossly defective eye conditions	8 per cent
Grossly defective lung conditions	4 per cent
Grossly defective heart conditions	3 per cent
Hernine	5 per cent

These percentages will vary somewhat from the experience of others because of the variation in methods of classification, certainly such an array of physical defects among an average group of individuals emphasizes the importance of these conditions in the consideration of employment and the placement of workers.

The great majority of these defective workers may be satisfactorily employed because of the diversity of operations in the ordinary plant, but it is of vital importance both for the individual and his employer that such defectives be placed in occupations for which they are best qualified, and can contribute most to production.

The examination of drafted men indicated that about one-

Address delivered at Tenth National Congress, National Safety Council, Boston, Mass., September 26-30.

third were sufficiently defective to cause their rejection from the army. In industry it has been the experience that it is not necessary to reject any such high percentage of applicants, and such rejections should be only for the following reasons:

I. That employment would be a menace to the individual.
II. That employment would be a menace to fellow-workers.
III. That employment would be a menace to property.

As an instance of the first condition we might cite an individual with advanced organic heart disease; of the second, an individual with active tuberculosis; and of the third, an individual mentally unbalanced. In general, we find in the vicinity of fifteen or twenty per cent who require, because of physical conditions, selected employment under more or less frequent medical supervision.

Advantages of Examination

Physical examination should, and, if properly done will, bring about a more intelligent placement of applicants for work, the discovery and subsequent correction of many physical conditions which would be prone to become more serious and affect the productivity of the individual, the elimination of persons who because of physical defects are unfit for employment, the transferring of certain persons already engaged to occupations for which they are better adapted physically, and lastly, the closer acquaintanceship between the worker and the physician and therefore opportunity for advice and instructions in matters of health.

The second function of an industrial medical department, which is ordinarily considered as the first, has to do with the treatment of different abnormal conditions. Industrial dispensaries were primarily established for the purpose of treating wounds resulting from industrial accidents, but it very quickly became apparent that disability due to sickness was as important as that due to accident, and for that reason we should provide facilities for taking care of disease as well as injury.

The factory dispensary should provide in so far as possible for the remedying of defects found as a result of physical examination; it should provide for treatment and giving of necessary advice to such workers as are taken sick during work, and should provide for the earliest possible treatment of accidental injuries.

Without detracting from the great credit due to the work of safety departments, it is fair to say that much of the accident disability reduction has come about through the early treatment of trivial wounds. Infections are ordinarily the cause of a high percentage of accident disability and the safety director working with the foreman to bring the injured man immediately to the dispensary for treatment has eliminated thereby a large amount of time lost from infections. The earliest possible treatment of wounds is the most important feature of this type of work.

As has been indicated, dental defects are very frequent among workmen and are the cause of much discomfort and loss of time. The effects on general health of such conditions are being brought to our attention more clearly, and it has been found practical in many factories to install dental service in connection with the dispensary work. The same is to a considerable degree true of eye defects, and at slight cost to the company both these services may be maintained and yet furnish such service to the workman at a very nominal cost and a minimum amount of time lost from work.

Functions of the Dispensary

Generally speaking, the factory dispensary should provide for the treatment of as many different types of cases as facilities will allow, and in such cases as it seems impractical to furnish treatment in the factory dispensary, the clinic should serve at least as a clearing house and advise such individuals as to where and how they may receive the best treatment. In other words, if it is not practical to provide actual treatment in all cases, it should be the function of the medical department to supervise and follow up all such cases and see that the desired result is obtained.

The third function of the medical department has to do with the supervision of factory sanitation and elimination of disease hazards. Much of this work may come within the jurisdiction of either a safety director or an engineer, but the direct effect of working conditions on the health of the employes demands that much consideration be given to this question by the industrial physician. We are coming more and more to realize the importance of ventilation, light, heat, toilet facilities, etc., and it is necessary that these subjects be given due consideration as a part of the health program.

Elimination of Occupational Diseases

The elimination of occupational disease hazards should be even more within the realm of the industrial physician's work. He should be the person best acquainted with such conditions and should have the knowledge of how either to eliminate entirely or at least minimize such hazards. The rubber industry offers several chemical hazards, notably lead, benzine, benzol, analine, and urotropin. As has been demonstrated in many cases, it is possible to either eliminate entirely or at least to reduce the harmful effects of these chemicals to a negligible hazard. The accomplishment of this end requires the knowledge of the sources of danger, proper mechanical safeguarding, frequent physical examination of individuals exposed, transferring of susceptible individuals to other occupations, and intelligent medical treatment in such cases as require it. It may be of interest to state that during the last four years no compensatable disability due to occupational disease has occurred in our factory.

Even when we have created a satisfactory health program for the workers within the factory, we must still realize that these people spend hardly more than a quarter of their time in the factory, and that, if we are to create the greatest possible constructive influence on health, we must seek to improve home and community conditions, in some cases cooperating with other agencies, and in others working directly.

Probably one of the most direct methods of improving health standards in the home and of minimizing lost time on account of sickness and injury may be obtained through visiting such cases by means of nurses and when necessary supplementing their visits by the services of a physician. Ordinarily about one-third of industrial absenteeism is due to sickness or injury, the other two-thirds to personal reasons. A nurse is usually more competent to investigate absences, because she is familiar with and able to deal with the cases of sickness and injury, and should, if properly trained, be equally competent to deal with such cases as are absent for personal reasons. Then, too, a nurse's visit is less apt to be resented and considered as "policing" than is a visit by an ordinary investigator. A competent nurse, properly acquainted with the factory and the workers, discovers many conditions important from both an employment and a health standpoint, and forms a relationship between the home and factory which is of inestimable value.

The Necessity of Education

Throughout the whole program as it has been outlined, constant attention should be given to the matter of education in health and personal hygiene, concerning which the average individual knows little. Much more can be accomplished by individual, than by group instruction in such matters, although the constant individual effort of the doctors and nurses may well be supplemented by different types of articles and printed information relative to matters of health.

In the Hood Rubber Company we have succeeded in reducing lost working time as our medical and allied activities have become more comprehensive and better coordinated. Our experience in medical work has covered a period of over ten years. We have probably the oldest factory dental clinic, as well as one of the earlier ocular and X-Ray clinics. A number of years ago we recognized the importance of physical examination, and shortly after instituted home visiting of absentees by nurses, later supplemented by medical supervision of those disabled by disease or injury. The Benefit Plan, providing for sickness, non-industrial accident, death benefits has been effective since January 1, 1919, while we have conducted our own Compensation Insurance Company since August 1, 1920.

During the last twelve months, in spite of the fact that 35 per cent of our workers are women (and the female absentee rate exceeds by 80 per cent that of males) our average amount of working time lost has been only 3.9 per cent. Two per cent of this was due to personal reasons, 1.7 per cent to sickness, 0.13 per cent to industrial accidents ,and .08 per cent to non-industrial accidents.

Translated into working days lost, this means that our factory workers averaged to lose 11.76 days from all causes, of which 6 days was due to personal reasons, 5.13 days to sickness, .39 days to industrial accidents, and .24 days to non-industrial accidents. Compared with other morbidity statistics, which indicate a loss of anywhere from seven to twelve days on account of sickness alone, our record of 5.13 days is very favorable. It would seem, too, that our industrial accident disability rate of .39 days would represent a minimum

In industrial medicine, as nowhere else, we have the opportunity of preventing or at least minimizing disability due to sickness or injury, and we should always keep this preventive element of the program foremost in our minds. It is not well to attempt "to make history too fast" particularly when dealing with the human element, and this is especially true in industrial medicine. From a modest beginning, by constant effort and the giving of good service, credit with your workers, your management, and the community at large will gradually be developed, and in proportion to the development of this credit, definite, useful results will be accomplished.

Drying with Moist Air

(Continued from page 49)

as with rubber which is ruined at 170 deg. F. in dry air but is actually improved at 170 deg. F. in moist air, it would seem as though the presence of humidity in the air makes a difference in the effect or action of the heat, although no proof or even serious investigation of this possibility appears to have been made.

Similarly, no investigation seems to have been made of the apparently greater penetration of the heat of a moist air. A letter from the Bureau of Standards, April 26, 1921, confirms the speaker's conclusion after days of search that, for example, nothing at all is known as to the comparative thermal-conductivity of moist and dry air.

There are many other problems and phases of the subject of drying with moist air not possible to discuss or even to mention in a paper limited to twenty minutes. Under the general title of this paper it may well seem, nevertheless, that there should be included some description and explanation of the various ways by which air may be and is humidified for drying purposes, and of the ingenius devices and types of dry room construction by which the relative humidity as well as the temperature and the circulation of the air in drying chambers is controlled and regulated.

Accomplishing Humidification

In the Hunter System humidification is accomplished by forcing all the air that enters the drying room over exposed water contained in shallow pans within the room. By raising or lowering the temperature of the water, as through steam coils placed in it, the rapidity of vaporization and hence the amount of vapor supplied to the air is increased or decreased. By providing an area of exposed water in a certain known proportion to the area of the room, and with the volume and the velocity of the entering air known and approximately constant, it is thus possible to secure any minimum relative humidity desired at any temperature within the range of ordinary drying temperatures by merely controlling the heat of the water. With the present time-controlled regulators, therefore, it is possible automatically to increase or decrease as well as to maintain constant either the temperature or the humidity of the air.

The method of circulating the air is as unique in the Hunter System as the method of humidifying it. The outstanding feature is that a circulation sufficient to remove hundreds of pounds of water an hour can be maintained without the use of any motive power whatsoever, for no fans, blowers, pumps or other moving parts are required, although fans may be and are employed where an unusually rapid displacement of the air is desirable.

There is a narrow heating compartment H on each side of the drying room R extending the length and the height of the room, with sufficient radiation C in it to give any temperature desired. Small ducts I D draw the outside air into each of these chambers because of the much higher temperature in them. The air is, however, forced from the chamber into the drying room itself through slits S extending the length of the room on each side, and so the entering air is uniform in temperature, volume and velocity at every point of entrance. In passing through these uniformly narrow slits, the air passes over the exposed heated water P and so the moisture content of the air is thus also uniform.

The air is drawn out of the room through small ducts O D at the floor line which also go into and up through the heating chamber, and is discharged through manifolds M into stacks leading to the outside of the building. As the temperature of the ducts in contact with the steam coils in the heating chamber is very much higher than at the source on the floor of the room, there is created, as with the in-take ducts, a powerful suction of air through them.

The downward circulation of air within the drying room is of course aided by the tendency of the air to fall to the floor, for the weight of the air is increased more by its continuously decreasing temperature after leaving its source of heat and after contact with the material to be dried than decreased by its increasing moisture content. (3)

On the other hand, this conflict of tendencies to rise and fall produces a kind of re-circulation and agitation of the air within the chamber, and insures a recurring and sufficiently prolonged contact between the air and the material to allow the air to absorb approximately its full moisture load before leaving the room. In fact, as the air does not chill rapidly until it has absorbed a considerable amount of moisture, this system of circulation tends to keep the heated air from leaving the room until it has fully accomplished its destined work of vaporizing and absorbing the moisture in the material to be dried.

(3) Thomas G. Marlow, *Drying Machinery & Practice*, London, 1910, page 61, gives theoretical formulae for this and Hausbrand, as above, page 68 confirms the conclusion.

A Hard Rubber Substitute

Austrian Patent No. 83,275 is concerned with the manufacture of a very interesting artificial product, which may be used to good advantage as a hard rubber substitute. The starting materials in the manufacture are hard rubber dust, phenol formaldehyde condensation products and cresol. The first step is to make a thorough mixture of these products, which is done to best advantage in the regular rubber mixing rolls. Then the mixture is heated for fifteen minutes only at a temperature of 120 to 130 degrees C. Care must be taken to see that there is no overheating, for it is desired that the phenol condensation products be hardened partially only, so as to form intermediate products instead of the customary hard product, which will be formed in case the heating proceeds too long. The finished product may be molded into any form desired. Due to the excess of phenolic substances that it contains, it possesses antiseptic properties. It is admirably well suited for making surgical instruments, the mouthpiece of telephones, and other similar articles where it is advantageous to secure an antiseptic action.

The Acceleration of Vulcanization by Organic Accelerators

By A. Maximoff

(Continued from the preceding issue)

IV. The Reactions in the Acceleration of the Vulcanization of Rubber by the Sulphide and Disulphide of Thiouramine in the Presence of Metallic Oxides

This has been one of the most attractive problems in rubber research up to date and has occupied the attention of the greatest rubber technologists in the world. Many rubber men have assumed that the accelerators play the role of an intermediary between the rubber and the sulphur by forming unstable compounds with the latter, which decompose readily when they come in contact with the rubber and yield to it their sulphur content. The case of the sulphide and the disulphide of thiouramine is very interesting when attacked from this theory.

We may assume that the disulphide of thiouramine yields its sulphur to the rubber in the presence of zinc oxide or lead oxide. At the same time the sulphide is formed, which unites with the free sulphur in the mixture to form anew the disulphide. In other words we have an entirely reversible reaction, which means that the sulphide of thiouramine, when used in a sufficient quantity in the presence of zinc oxide, is able to vulcanize rubber only when sulphur is absent from the compounded mixture. We have mentioned above cases of actual practical experience in the mill, where rubber was vulcanized without the addition of sulphur. On the other hand when 20 per cent of the disulphide is used (calculated on the weight of the rubber), repeated tests showed that no vulcanization took place. In other words the S liberated from the disulphide does not vulcanize the rubber but combines with the sulphide to form the disulphide.

The investigations, made to determine what happens when the vulcanization of rubber is accelerated with the aid of the substances, which have been described heretofore in this article, have shown that zinc and lead salts of dithio-carbamic acid are formed, which compounds are themselves active accelerators of vulcanization. In both cases when the sulphide and the disulphide of thiouramine are melted with zinc oxide, the same zinc salt is obtained. Our experiments also showed why it is impossible to secure acceleration of vulcanization when magnesium oxide, calcium oxide or barium oxide were used with the same thiouramine compounds, for when these alkaline earth metal oxides were melted with the disulphide or sulphide of thiouramine, similar salts of dithiocarbamic acid were not obtained as in the case with zinc or lead, but instead tetramethyl-thiourea was formed with an evolution of carbon disulphide vapors. The thioruea compound, as we know, is not an accelerant of vulcanization which explains why these oxides destroy the accelerating powers of the sulphides.

Furthermore it may be deduced from these observations the cause of the fact that the aromatic amines are not as strong accelerants of vulcanization as the amines of the fatty series. For the aromatic derivatives of the disulphide of thiouramine decompose when heated gently, with the formation of homologues of the thioureas, which are also non-accelerants of vulcanization. For example, it was found that when 0.5 per cent of the disulphide of diphenylthiouramine was used in a rubber mixture in admixture with zinc oxide or without it and with the addition of 3.5 per cent of sulphur, then vulcanization did not take place within 15 minutes at a pressure of 2 kilos per square centimeter.

V. The Lead and Zinc Salts of Dithio-carbamic Acid and its Homologues

In all the tests which have been described above, it has been seen that the lead and zinc salts of the homologues of dithio-carbamic acid have always acted as energetic vulcanization accelerators. Our definition of energetic accelerators excludes any substances which do not diminish the time of vulcanization by at least one one-hundred. Neither piperidine nor the secondary fatty amines or their combinations with the sulphides of thiouramines can be placed in this category. When they are used alone without the addition of zinc or lead oxide, they are able to increase the rapidity of vulcanization only 5 to 10 times. In the presence of these two metallic oxides however they become endowed with strong accelerating powers, but this is not due to any inherent property peculiar to them, but to the fact that zinc and lead salts are formed during the progress of the vulcanization.

Mixture Used in Tests

In making the practical tests, the following mixture was used: Rubber 100 parts, sulphur 3 to 3.5 per cent. The accelerator 0.5 to 2 per cent. This mixture was vulcanized under a pressure of 20 to 30 pounds or 1.3 to 2 kilograms per square cm. If the accelerator is capable of increasing the rapidity of vulcanization 100 times, then the vulcanization should be complete or at any rate almost so in a thickness of rubber from 2 to 8 millimeters, when the latter is vulcanized under pressure for 10 to 20 minutes. When this is not the case, that is when the accelerant does not possess such power, then there is practically no vulcanization at all.

The lead and zinc salts were prepared as has been explained above, by fushion with or without the addition of sulphur, or by a double decomposition. In every case the same lead and zinc salt was obtained with both the dimethyldithio--carbamate, the sulphide and the disulphide of tetramethyl-thiouramine. The following experiments were made with the zinc salt. It was first mixed with rubber and sulphur in the proportion of half a part of the salt to 3.5 parts of the sulphur and 100 parts of the rubber. In the second experiment the same proportions were used with the addition of 2 parts of zinc oxide. In the third experiment no zinc oxide was used, but the proportion of the zinc salt was increased to 2 parts. The first two tests were made at 2 kilograms per square centimeter pressure for a duration of 15 minutes, and the last experiment was carried out at the same pressure for a duration of 20 minutes. In the first case there was scarcely any vulcanization noticeable at all. In the second case the vulcanization was practically complete without any efflorescence of sulphur on the surface of the vulcanized rubber. In the third test the results were the same as in the second experiment, and no efflorescence of sulphur was noticed for several days after the vulcanization was performed.

Acidity of Resins Retards Vulcanization

A study of the three tests shows that it is the acidity of the resins in the rubber that is responsible for the impedance of the vulcanization, for when zinc oxide is added and the acidity neutralized, then the vulcanization proceeds unhindered. The same results were obtained with the lead salt.

The same method was used in the examination of the lead and zinc salts of the compounds, formed by the action of carbon disulphide on piperidine, diethylamine, ethylamine, disiosbutyl amine di-isoamyl amine and benzylethyl amine. All these salts possess strong accelerating powers. It was found that the zinc salts, which were obtained by melting an amine derivative with zinc oxide and sulphur, and then extracting the same with chloroform or carbon disulphide, gave much better results, when they were purified completely or when they were obtained by the double decomposition method, than when they were used in the unpurified form. Up to the

present time the writer has not been able to determine the cause of this interesting property of the zinc salts, nor has he been able to isolate any intermediary combinations of these substances with sulphur

VI. The Influence of the Disulphide of Thiouramine and of the Zinc Salt of Dimethyldithio-Carbamic Acid on Surface Tension of the Sulphur

The effect of the sulphide of thiouramine on sulphur has been determined qualitatively and has been found to be negligible. In the case of the zinc salt, however, which is obtained by the fusion of the disulphide with zinc oxide, there is a considerable reduction in the vapor tension of sulphur. In a capillary tube, one millimeter in internal diameter, molten sulphur rises to a height of 6.4 millimeters. If 2 per cent of tetramethyl-thiouramine disulphide is added to the sulphur, there is no appreciable change in the height of the material in the capillary tube, but when 2 per cent of the zinc salt of dimethyldithio-carbamic acid is added, then the molten sulphur rises to a height of 9.5 millimeters. The vapor tension of the sulphur has been reduced considerably.

VII. Application of the Organic Accelerators to the Manufacture of Manufactured Rubber

A good many rubber men have been somewhat opposed to the use of organic accelerators in the vulcanization of rubber. They claim that the life of rubber articles, vulcanized in this manner, is comparatively short. In many cases this has been due to the fact that the accelerators were added to mixtures which, to start with, contained a large proportion of sulphur. The proportions of the ingredients in the rubber mixture must be changed radically, when the accelerator is added. When the same proportions are retained, the vulcanization does not take place properly, and the vulcanized articles do not have a long life. However, experience has shown that the proper adjustment in the proportions of the rubber mixture gives vulcanized articles, which have shown no deterioration under observation for two or three years.

The principal change, that must be made, is in the amount of sulphur used. Experience has shown that in order to get good results, this must and can be reduced to a proportion of 1.5 parts of the sulphur to 100 parts of the rubber. Such vulcanized rubber was tested and found to have a resistance of 200 kilograms per square centimeter, an elongation at rupture of 800 per cent and a permanent elongation of from 1 to 4 per cent.

It must be remembered that too small an amount of sulphur can be just as deleterious to the life of the manufactured articles as an excess of the same. In one case the vulcanization took place with the use of 1.5 parts of sulphur per 100 parts of rubber and the addition of an accelerator. The result was a piece of vulcanized rubber which had a breaking resistance of 190 kilograms per square centimeter and an elongation of 830 per cent, twenty-four hours after vulcanization was performed. Two years later, the resistance to breaking had been reduced to 18.3 kilograms per square centimeter and the elongation to 388 per cent.

The accelerant, that was used, was obtained easily and simply through the treatment of a benzol solution of carbon disulphide with dimethyamine. The latter compound was prepared by reacting with caustic soda on nitrosodimethylamine; the nitroso compound was made by treating dimethylaniline with sodium nitrite.

The Advantages of the Use of Vulcanization Accelerants

In general the advantages of the use of accelerants in the vulcanization process are an increase in the output of the vulcanizers due to the reduction of the time of vulcanization, a reduction in the coal consumption per pound rubber vulcanized as the accelerant enables the vulcanization process to take place at a lower temperature, a reduction in the temperature of vulcanization in the case of repairing the vulcanized articles, the prevention of the efflorescence of sulphur in finished vulcanized articles, etc. Besides these general advantages the following specific ones have been observed in actual practice.

1. On account of the difficulty of obtaining a good grade of magnesia and because of the necessity of using moist steam in the process, it was very difficult to vulcanize rubber articles used in surgery. The mixture, that was used, was very sensitive and the manufactured articles had blisters on the surface. The addition of a very small amount of the accelerator, with the proper change in the proportions of the ingredients in the vulcanizing mixtures, was sufficient to suppress this tendency to blistering.

2. Lead oxide stored in the mill thickens and it is impossible to use it in that condition or to retreat it so that it can be used. It was found that the amount of this oxide that was required in the manufacture of galoshes could be reduced to from one eighth to one tenth of the original figure by the use of the accelerator. It was then unnecessary to store the material on the plant in such large quantities and the loss of the same by caking was avoided, while a reduction in cost was effected by the use of less of the substance in the vulcanizing compound.

3. An interesting substitute for leather soles is made from a mixture of ground leather and rubber. But the difficulty in making this product is that the leather decomposes at the temperature used in the ordinary vulcanization processes, and heretofore it has been impossible to vulcanize such a mixture. When a small amount of the accelerator is added to the vulcanizing compound, then the temperature of vulcanization may be reduced to 100 to 105 degrees C. Such a process is covered by Russian Patent No. 70,011, volume 12, 1916.

4. A cement has been made which is composed of two solutions, one containing rubber and sulphur and the other containing rubber, the accelerator and zinc oxide. Such solutions have an indefinite life. They may be mixed for use in equal parts. It is just necessary to heat the articles, which have been sized with this cement, to 100 degrees C to obtain vulcanization within a few minutes. This process has been patented by the "Bogatyr Company. An interesting fact was observed in the preparation of this size. When the mixture of rubber, zinc oxide and accelerator was dissolved in benzine without the addition of sulphur, in certain cases a vulcanization of the solution was obtained, due to the rise in temperature during the mixing operation. In the presence of the metal of the mixer, what really happens is that the disulphide compound accelerator is broken down to the sulphide with the liberation of sulphur, which then causes acceleration to take place in the presence of zinc oxide and the sulphide accelerator.

5. Due to the use of accelerators we can obtain mixtures which may be used in the repairing of various rubber articles, such as pneumatic tires, balls, surgical articles, etc.

Conclusion

In conclusion it may be mentioned that, when the mixtures contained a large proportion of sulphur, from 6 to 8 per cent, and also of zinc oxide, from 10 to 20 per cent, it was observed that the vulcanization was so rapid that it took place at the ordinary temperature. The time the vulcanization takes depends on the temperature to which the materials are heated in the vulcanizers. The time varies from 2 days to 6 or 7 weeks. Under these conditions the vulcanization is regular throughout the entire mass. The vulcanized articles may be of any thickness desired and they are always absolutely homogeneous throughout their entire structure. It is necessary to watch the mixtures very closely; otherwise there is danger of them vulcanizing during their passage through the callender rolls or even in the mixers themselves.—*Translated by Ismar Ginsberg, September 16, 1921*

Gutta Percha Solutions

British Patent No. 165,572, assigned to the Cambridge Street Rubber Mills of Manchester, England, is concerned with the making of a solution of gutta-percha for the uniting of rubber to leather. This consists of about one part of deresinified gutta percha or balata dissolved in three parts by measure of carbon disulphide. The surfaces to be united are roughened, coated with the solution that is allowed to dry, heated and pressed together. A thin layer of gutta percha may be interposed between the leather and the rubber.

ABSTRACTS

Technical — General — Commercial

Recovering Rubber and Textile Material from Rubber Fabric

British Patent No. 167,669 is concerned with a process and apparatus for recovering rubber and the textile material from rubber fabric. The object of the patent is to separate these two substances without injuring either of them.

The old rubber is first ground up coarsely and introduced into a container, which is made in the form of a cylindrical vessel, set up on end. Inside of the container there is a rotating drum which is perforated throughout its entire circumference. Inside this drum there is a stirring device, which consists of a number of paddles mounted vertically on horizontal arms, extending out from the central vertical shaft. The stirring device is rotated independently of the drum by means of a hand lever, connected by gears to the shaft. The drum itself is driven from below the container by means of a bevel gearing. The drum rotates first in one direction and then in another.

A tank is provided for solvent feed. Such substances as benzol, tuluol, zylol and ether are used as solvents. When the solvent has been admitted to the apparatus through a suitable pipe connection, the agitators are raised and the drum is rotated rapidly. The material is churned up vigorously and kneaded by the rotation of the drum and the rubber goes into solution. The rubber solution is removed from the apparatus to a tank and the drum is rotated rapidly again. The stirrer is now lowered and fresh solvent is added and the drum is now rotated at a lower speed. Then the speed is increased again to the maximum point and the remaining rubber in the fabic is extracted in this manner. The second rubber solution is added to the first. Hot gas is now introduced and blown through the fabric to dry it. The gas distills off some solvent and this is recovered by passing the gas through a condenser. The residual gas then passes into the heater where it is heated again and then reused.

The solution tank is surrounded with a steam jacket and the temperature is maintained at about 115 degrees C., which is about 15 degrees below the vulcanization point of rubber. The pressure in this tank may be produced by heating or it may be increased artificially. Under these conditions, it is claimed that the regenerated rubber has an elasticity which is not much less than that of the original material.

Raw Rubber Coagulated with Alum

It has been found that raw rubber which has been coagulated with alum will vulcanize 10 per cent slower than rubber which has been coagulated with acetic acid. However if sulphite of soda is added to the latex, the rubber, prepared with the aid of alum does not show any difference in time of vulcanization in comparison with acetic acid coagulated rubber.

Increasing Elasticity in Vulcanized Artificial Rubber

German Patent No. 301,757 is concerned with a method of improving the elastic qualities of vulcanized artificial rubber. This patent has been issued to Bayer & Co. Before vulcanization about 10 per cent or more of an oily substance is added. Such materials as petroleum, castor oil, linseed oil, paraffine oil, hemp oil, safrole, aniline, alkyl anilines, xylidine and dimethyl para toluidine.

Accelerators of Vulcanization

Japanese Patent No. 34,944 is concerned with the acceleration of vulcanization by the use of a solution of sodium or potassium salts in conjunction with primary or secondary aromatic amines. About 10 grams of the potassium or sodium solution is used to 100 grams of aniline, diphenylamine or toluidine.

Chemical Nature of Rubber Resin

In a recent paper read by Professor G. S. Whitby of McGill University, Canada, there were described some very interesting and important observations made in connection with an investigation into the chemistry of raw rubber and the vu'canization of rubber. A description of experiments made on the resin of rubber, which though it forms but a small portion of the raw rubber, is very influential in the vu'canization process and in other ways. This represents the first successful attempt to elucidate the problem of the chemical nature of a constituent of rubber. The investigations showed that a considerable number of crystalline bodies can be isolated in small amounts from raw rubber. One substance was found which is of a sugar like nature. This interesting body was known to occur in the rubber latex, but on account of its great solubility in water its presence in raw rubber was not suspected.

Rubber may be converted into an artificial resin by the absorption of oxygen from the air under the influence of catalysts. This may lead to the production of lacs and varnishes from rubber. This study is also interesting in its relation to the "perishing" of rubber.

Vulcanization of Rubber at Low Temperature

United States Patent No. 1,386,153, which has been granted to G. Bruni and assigned to Pirelli & Co., of Milan, Italy, is concerned with a process for vulcanizing rubber, which has for its object the following improvements: one, to shorten the time of the vulcanization so as to effect an economy in the fuel consumption and an increase in the plant capacity; two, to accomplish vulcanization at a low temperature, that is below 100 degrees C and even at ordinary atmospheric temperature so that it is possible to conduct the process in hot or tepid water and avoid thereby the use of steam under pressure; and three, to improve the durability and the mechanical qualities of the rubber thus produced.

In the use of accelerators to assist the process of vulcanization it has been found that the use of the substances that are mentioned in this patent will give results which are much more perfect and more rapid than any that may be obtained with the use of the known accelerators. When these substances are used in the proportion of 2 to 0.2 per cent of the rubber that is present in the compound, complete vulcanization is obtained within 5 minutes at a temperature of 120 degrees C., or within a longer time when the process is carried out at a lower temperature, at which point all the known accelerators do not even start a vulcanization. The vulcanized products that are manufactured in this manner have been to possess greater durability and mechanical strength.

The reagents that are employed in this process are the salts of bivalent or trivalent metals of the N-monoalkyl or N.N dialkyl or N.N alkylene dithiocarbamic acids or other disubstituted dithiocarbamic acids, which have the general formulae:

$$\left(C\begin{matrix}\diagup NHR^1 \\ =S \\ \diagdown S_2\end{matrix}\right)_2 Me'' \quad \text{or} \quad \left(C\begin{matrix}\diagup NR_2 \\ =S \\ \diagdown S\end{matrix}\right)_2 Me'' \quad \text{or} \quad \left(C\begin{matrix}\diagup NR'' \\ =S \\ \diagdown S\end{matrix}\right)_2 Me''$$

In these formulae, R^1 may be an alkylic or other monovalent organic radical or chain, R'' an alkylenic radical or other organic bivalent radical with open or closed chain and M'' a bivalent metal such as magnesium, zinc, cadmium, mercury and the like, or any inorganic bivalent radical such as uranyl.

NEWS OF THE INDUSTRY

News -- Personals -- Financial -- Building Activities -- New Products

News from the Rubber Metropolis

"All Is Well", in Akron—Plant and Stock of Portage Goes to Seiberling—Changes in Mason Tire & Rubber Co.—May Operate Old Kelly-Springfield Plant

Only Brightness Ahead

(Special Akron Correspondence)

Officials of Akron rubber companies are practically unanimous in their prediction that the tire manufacturing center of the world will be back to normal by January 1, 1922.

This prediction was made in the columns of THE RUBBER AGE some time back, and all developments in the rubber industry since that time have supported it. No matter what production is maintained during the closing months of 1921, the new year is practically certain to find the rubber industry all set to go ahead on a normal basis.

Akron, however, is not going to have a hard winter. All are agreed on that point. The Rubber City has passed through the winter of discontent and hardships. That came a year ago. Now the trade sun is shining and business has taken on a new lease of life.

Most recent of the rubber company officials to make known his optimistic views is W. A. Johnson, automobile tire sales manager of the B. F. Goodrich Co. He expressed himself this month in an address before the Akron Kiwanis club.

Mr. Johnson gave these Akron business men many facts about the industry around which their city is built—many of these facts being entirely new to his hearers. He stated that Akron rubber companies since January 1 of this year had liquidated 3,000,000 tires out of their finished goods inventories, adding that this reduction of inventories had released between $50,000,000 and $75,000,000 in working capital which served to stabilize the industry.

The number of tires liquidated this year alone, he explained, has been equivalent to at least 50 per cent of Akron's gross tire production of two years ago. In continuing this explanation, he said:

> For the last year rubber companies have been selling more than twice as many tires as they were making. Today practically all companies have reduced their inventories to a point as low as they ever will be. From now on every tire that is sold will have to be built. That is a very simple statement, but it is significant. Indeed the necessities of the business are such that after January 1 inventories will have to be enlarged. This has a very healthy meaning for Akron's labor situation.
>
> We are not going to have a hard winter in Akron. We have already passed through the winter of discontent and hardship. The sun is shining and all is well. The liquidation of our tire inventories and the subsequent release of between $50,000,000 and $75,000,000 in working capital has been the saving grace of the situation here.
>
> Looking into the future, it is very bright. Statisticians figure that the point of absorption, as far as roads are concerned, will be reached when we have 15,000,000 motor cars in this country. That is over 5,000,000 more than we have now. And even when that point is reached, the replacements of worn-out machines each year will be greater than our present production of automobiles. And this does not include consideration of expansion of the automotive industry in other nations.
>
> Even during this bleak period we have made progress. The automotive industry a year ago was the third largest industry in America. Today it stands in second place, outranked by steel alone. And we in Akron are part of the automotive industry. It is encouraging that during this time of stress motor vehicle transportation has so demonstrated its essentiality that it has mounted one step higher on the ladder of American industries.
>
> Five years from now tire replacements alone will exceed our total present annual production, and there is no telling what original equipment demands will be in addition.

From a speech delivered in Akron recently by President E. G. Wilmer of the Goodyear Tire & Rubber Company, statements of a very similar nature are taken.

In addressing 200 Goodyear executives at a dinner, Mr. Wilmer said:

> Despite the pessimism that still exists in many quarters and despite fears of many that there is a hard winter ahead, I am confident that we are going to have a mighty decent winter.
>
> I see nothing but brightness ahead for Goodyear. We have emerged from a five-month period of uncertainty and strong competition. We turned the first corner in May when our refinancing program was completed. We are just now turning the second corner. Goodyear spirit is unbroken.. It will carry us to greater victories than we have won in the past.

Wilmer declared that although sales for the first six months of 1920 had been the greatest in volume in Goodyear's history, sales for the first nine months of this year had exceeded those for the first nine months of last year.

And from the Mason Mail, the factory organ of the Mason Tire & Rubber Company of Kent, this cheery message is taken:

> Double Time. The ald army term for more speed. It is double time and better for the Mason Tire and Rubber Company this year.
>
> Production is about to be increased, sales show an advance of 100 per cent, and this year will increase the dealer accounts on the ledgers of the Mason Company more than 150 per cent.
>
> Contracts have been let for additional machinery and equipment whereby the production of tires and tubes will be increased to 4,000 a day by January 1st.
>
> This new production figure comes as a result of a decided increase in both sales and new accounts during the present fiscal year.
>
> Sales for the month of August were double those of July and the total sales for 1921 will show a decided increase over those of 1920.
>
> The dealer accounts for each month this year have shown a consistent gain, with a 150 per cent increase for 1921 assured.

Seiberling Gets Portage

(Special Akron Correspondence)

Referee in Bankruptcy Harry L. Snyder of Akron has ordered the sale of the plant and stock in trade of the Portage Rubber Co. at Barberton to Frank A. Seiberling, former president of the Goodyear Tire & Rubber Company. The order was made despite the announced intentions of attorneys for stockholders to carry their fight against the sale to the federal district court in Cleveland.

Referee Snyder's order was based upon the petition of George D. Bates, Akron banker and trustee for the company's assets. His decree gave the attorneys for stockholders 10 days to file an appeal in federal court asking for a review.

Burrows, Preusser and Morris of Cleveland who entered the proceedings as representatives of stockholders, mailed circular letters to all share-holders urging them to take action lest their investments be wiped out by the sale of the Portage property.

It was pointed out during the hearing that the fixed assets of the company are worth $1,559,000, according to court appraisal, or over $800,000 more than the $750,000 offer made by Mr. Seiberling. The liquidation of the accounts receivable assets and other accounts is left by Seiberling's offer to the bankruptcy court.

According to W. E. Young, attorney for Mr. Bates, all the creditors were unanimous in approving the order for the sale to Mr. Seiberling. They would receive about 70 cents on the dollar under the Seiberling plan of settlement, if the accounts receivable were collected, he explained.

The company's liabilities are said to be about $2,000,000.

Changes in the Mason Company

(Special Akron Correspondence)

Several changes in the personnel of the Mason Tire & Rubber Company at Kent have been announced.

George L. Morse, for two years assistant auditor, has been appointed general auditor to succeed A. C. Grundman. Before going to the Mason company, Mr. Morse was factory accountant for the Ideal Tire & Rubber Co. of Cleveland.

R. D. McWhorter has joined the Mason legal department. He formerly was affiliated with the treasury department of the Goodyear Tire & Rubber Company.

H. M. Johnson, credit manager, has been appointed assistant treasurer of the company.

News from the Trenton Manufacturers

Mixed Business Conditions in Trenton—Hardman Receiver Given Authority —Meeting of the Rubber Manufacturers Association of New Jersey—The Rubber Cloth Industry

Business Conditions in Trenton

(Special Trenton Correspondence)

While some of the rubber manufacturing plants at Trenton, N. J., and nearby towns are busy, others are not running full handed. The plant of the Lambertville (N. J.) Rubber Company was closed down on October 12 in all departments for an indefinite period. The company has not experienced such a backward season in many years. The plant of the New Jersey Rubber Company, situated at the same place, recently placed a night shift at work. While the Trenton plant of the Ajax Rubber Company is working three eight hour shifts, the factory at Racine, Wis., is running only two eight hour shifts. The company has decided not to lay aside any surplus stock of finished tires, but is shipping the product as soon as they are finished. The company has also disposed of all the high priced crude rubber on hand and with the new supply can produce cheaper tires. The Trenton plant is shipping about 6000 tires weekly. The Thermoid plant is not operating to capacity.

Hardman Rubber Co. Affairs

(Special Trenton Correspondence)

Vice Chancellor Backes, of Trenton, has granted authority to Edmund A. Hayes, receiver of the Hardman Rubber Corporation, New Brunswick, N. J. The vice chancellor made this decision after foreclosing on a $210,000 mortgage on the factory. It is also understood that the Stanwood Rubber Company, of near Elizabeth, which was recently sold, controlled the stock of the Hardman Company. The Hardman Company was formerly located at Belleville, N. J., where rubber goods were its chief product. The mortgage has been on the New Brunswick plant since 1918, when the factory came into the hands of the Hardman organization from the Endurance Tire and Rubber Corporation. Vice Chancellor Backes allowed counsel fees of $2000 and receiver's fees of $4000.

Sued for Infringement

A suit has been instituted in the United States District Court by the O'Sullivan Rubber Company, Inc., of 131 Hudson street, New York City, against a Hoboken, N. J. rubber dealer, charging infringement of a patented rubber heel. The defendant is Jacob A. Cohen, who, the complainant says, is known under several other names. Cohen, in an order issued by Judge Lynch, is ordered to show cause why a preliminary injunction should not be issued. The O'Sullivan Company alleges that the defendant is selling rubber heels, which have been patented by the plaintiff.

October Meeting of Rubber Manufacturers' Association of New Jersey

The regular bi-monthly meeting of the Rubber Manufacturers' Association of New Jersey was held at the Trenton Country Club on the evening of October 10th with about twenty-five representatives of member-firms in attendance, and President John S. Broughtan in the chair. A number of matters of importance were discussed after dinner had been served. The Howe Rubber Co., of New Brunswick, N. J., was unanimously elected to membership. A special meeting will be held in November, and the annual meeting and dinner will be held at the Trenton Country Club on Monday, December 12.

C. H. Oakley's Motor Cruiser "Querida"

The accompanying illustration shows the 40-foot motor cruiser *Querida* owned by C. H. Oakley, president of the Essex Rubber Co., Trenton, N. J.

During the past "Reconstruction Period" summer Mr. Oakley has been asking parties of his friends and members of his office force on occasional outings up and down the Delaware River and along the Jersey coast.

He has cruised 4,000 miles in the boat since he has owned it. During the past summer he was in the New York Athletic Club's cruise from Travers Island to Shelter Island in Long Island Sound, and last year the boat followed the Resolute and Shamrock yacht races.

In the party on the boat when Mr. Oakley took the accompanying picture may be noticed Joseph W. Thropp, secretary and treasurer of William R. Thropp's Sons Co., Trenton, the well known manufacturers of rubber machinery.

Mr. Oakley reports that the Essex Rubber Co. has been having good business during the depression, and has even enjoyed its usual annual increase in business—a fact very gratifying to all members of the organization.

In order to give employment to as many people as possible certain departments are running with three shifts a day. Approximately 350 people are being employed.

Miss Hannah Lister, Employment Manager and Supervisor of Physical Welfare at this plant, will attend the annual convention of industrial medical, sanitation and physical supervisors held under the auspices of the Pennsylvania Department of Labor at Harrisburg, Pa., October 24-27.

Address on Rubber Cloth Industry

(Special Trenton Correspondence)

Neil E. Bowan, president of the Pocono Rubber Cloth Company, Trenton, N. J., in a recent address before the Trenton Rotary Club on the History of the Rubber Cloth Industry, showed the great importance of that article. He said that the rubber cloth history dated back to 1791, when Samuel Peak took out a patent in England for waterproofing cloth by brushing hot rubber on it. In 1813 rubber was first dissolved in turpentine for the purpose of applying to cloth. Charles Macintosh, of Glasgow, proposed a solution of rubber and coal tar products in 1820.

Mr. Bowman said that in the early days rubber solution was put on with brushes, and that 1837 the first machine was patented for applying the solution to cloth and the same machine is in use to-day. The vulcanizing process invented by Charles Goodyear came into general use about 1844.

Rubber Cushion Brush Factory

Henry L. Hughs & Co., Lansingburgh, N. Y., manufacturers of brushes, are to move the rubber cushion brush department of their business to 295 Vernon Avenue, Long Island City, after January 1. They have leased 10,000 square feet of floor space there.

News from the Trade at Large

Fisk Rubber Company Buys Ninigret, Inc.—Rebuilding the Keystone Plant —Lee Tire Business Better—McGraw Tire & Rubber Co. Effects Agreement with Creditors

Fisk Rubber Co. Buys Ninigret

Deeds transferring all the property of the Ninigret Company, Inc., to the Fisk Rubber Company were filed Oct. 11, in Pawtucket, R. I., following the absorption of the Ninigret mills by the rubber company last month.

The company has acquired all the outstanding stock of the Ninigret Company not already held, and has issued in exchange common stock at the rate of four shares for each share of Ninigret.

There was also filed a trust mortgage for $10,000,000 from the Fisk Rubber Company to the Chase National Bank of New York to secure the issue of bonds in that amount by the purchasing concern.

Following the new financing by New York bankers changes were made in the Directorate. The board has been increased from seven to nine members. The new Directors are William F. Cutler, James Dean, Richard S. Russell and Ralph H. Bollard. The resignation of J. D. Anderson, F. T. Ley and G. A. Ludington were accepted. H. G. Fisk, formerly Treasurer has resigned to become Vice President.

The treasury department will be centered in New York as a result of the change in policy of transferring the executive departments of the Fisk, Federal and Ninigret companies, under the recent readjustment in that city.

Lee Tire Business Better

The sales of the Lee Tire and Rubber Company are slightly ahead of a year ago in actual money value, according to figures compiled by banking interests connected with the company, and in the number of units disposed of are 30 per cent better. The company's list of dealers in the last year has increased nearly 50 per cent. On August 31 the company's balance sheet showed quick assets of more than $4,000,000, against which were current liabilities of approximately $800,000.

National Standard's Engineering Department

The National-Standard Co., Niles, Mich., maintain an engineering department fully equipped for testing the beads used in straight side tires. They furnish complete confidential reports as to the stretch, set and bursting point of any automobile or truck tire bead without charge and no obligation is incurred on the part of the tire manufacturer in taking advantage of their service.

They have made many tests for manufacturers and will be glad to correspond with anyone interested in this service. Upon inquiry they will advise just what it will be necessary to send them for making the proper tests.

Will of the Late F. M. J. Pusinelli

F. C. J. Pusinelli, chairman of Messrs. Heilbut, Symons & Co., Ltd., the well known crude rubber firm of London, who died in Berne, Switzerland, a year ago, left a fortune of £459,280 1s 7d gross and £428,677 14s 1d net. After various bequests the residue of the property goes equally to his three sons one of whom Fred G. E. Pusinelli is treasurer of Poel & Kelly, 347 Madison Avenue, New York, the New York representatives of Heilbut Symons & Co.

Rebuilding the Keystone Plant at Erie

The plant of the Keystone Rubber Manufacturing Co., Erie, Pa., which was totally destroyed by fire on April 28 last, is now in the process of reconstruction, and, it is expected, will be in operation by December 1. Both tires and tubes will be manufactured. Their well-known Moomy tubes had extensive sale before the fire.

The rebuilt structure contains 55,000 square feet of floor space. Most of the machinery is already in position including the first calender manufactured by the Allen Machine Co., which passed unharmed through the flames.

The Erie City water supply failed for a brief period on the night of the fire with the result the flames which could have been easily controlled if they had had water gained such headway that the whole plant was burned.

The officers of the company are J. G. Moomy, president and treasurer, and his two sons Harry Moomy, secretary and general sales manager, and Joseph H. Moomy, vice president. Mr. J. G. Moomy has been for years one of the most highly regarded business men in Erie. The present business has been built up from a small beginning in the manufacture of mechanical rubber specialties.

Peter D. Thropp Operated On

Peter D. Thropp, treasurer of John E. Thropp Sons Co., manufacturers of rubber machinery, Trenton, N. J., was stricken with an intestinal complaint while on his way to Atlantic City on October 8 and was operated on at the Atlantic City hospital. At last reports his condition was favorable.

Gunn New Auto Stores Agent

John K. Gunn, of Burlington, N. J., has been selected by the United Auto Stores Company, Inc., as their Burlington agent. The United Company has opened fifty-six stores during the past two years and has its principal office in the Stock Exchange building, Philadelphia.

Firestone Co. to Insure Itself

The Firestone Tire & Rubber Co. of Akron has notified the state industrial commission that it will withdraw from the state insurance fund Nov. 1 and become a self-insurer. It has accumulated a $150,000 surplus since it has been in the fund, because of the low accident rate in its plant. While many concerns have a deficit. The withdrawal was announced following the recent raise in the premium paid by tire and rubber concerns, from 80 to 95 cents per $100 of pay roll. This rate was the result of computation of payments to employes of all rubber companies for accidents and accidental deaths.

New Trenton Activities

The Cadwalader Rubber Company has opened a new establishment on East State Street, Trenton, N. J., for the sale of tires and other articles. The Universal Tube and Tire Market and the Tire Sales Company have opened modern places on Perry street. The Excell Tire and Tube Vulcanizing Company is a new Trenton concern. The United States Rubber Specialty Company has a new establishment on Gladstone avenue.

Croeniger Manager for Lewis

The item in the September 25 issue of THE RUBBER AGE stating that Walter H. Bass was managing the crude rubber department of John D. Lewis, 2 Cliff Street, New York, should have read that he was connected with that firm's selling organization to manufacturers. Ernest F. Croeniger, formerly of L. Littlejohn & Co., is manager of their crude rubber department.

McGraw Co. Makes First Payment

McGraw Tire & Rubber Co. of Cleveland, Ohio has effected an agreement with creditors for an extension of payments and has made an initial payment on account of 10 per cent reducing outstanding liabilities to around $1,500,000.

The settlement of McGraw affairs by agreement was possible because of the strong showing of earnings made by the company since midsummer. August, the best month, produced net profits of $109,000 and September $85,000 a total of $194,000 for the two months. Orders on hand indicate continuance of the present scale of operations at about 2,000 tires and tubes daily to the end of the year.

Trustee for Knox Plant Appointed

Attorney Paul M. Ashbaugh of Mount Vernon, Ohio, was elected trustee of the Knox Tire & Rubber Co. of Mount Vernon at a meeting of creditors on September 20. His bond was fixed at $30,000. The Hydro-United Rubber Co. of Pottstown, Pa. it is reported, will bid for the plant. J. G. Feist and G. A. Neil of this company inspected it recently.

Mid-West October Meeting

The October meeting of the Mid-West Rubber Manufacturers' Association was held at the Hotel Morrison, Chicago, October 11 wtih 28 members in attendance. Although a small meeting, it was of more than usual interest.

Frank B. White of the Agricultural Advertisers' Service, Chicago, was the principal speaker, and was given a rising vote of thanks.

B. F. Kinder of Binney & Smith, gave an interesting account of the manufacture of carbon gas black tracing the progress and development from the time it was first manufactured in Indiana to the present enormous scale of production in Louisiana and other states.

Arthur E. Swanson of Swanson, Ogilvie & Co., Industrial Engineers, 1435 First National Bank Building, Chicago, who was formerly on the executive Board of the Firestone Tire & Rubber Co., said that some branches of the automobile industry were having the largest business they ever have had. Clothing and other lines are also in great demand. Household furnishings are still very high, but generally prices are stabilizing.

Mr. Swanson's connection with the War Trade Board as Director of the Bureau of Research during the war will be well remembered by many members of the trade. It was on the statistics compiled by him that the restrictions on the importation of crude rubber were based.

Charles E. Wood, Crude Rubber, New York and Akron, stated that in his recent trip through the Middle West, he had found conditions gradually improving, mentioning insulated wire factories running night and day, 220 houses being built in Dayton, Ohio, and considerable building in many other cities. Speaking of crude rubber he said that Brazil has suffered very much on account of low prices in the East Indies.

Mr. Wood declared that wild rubber from Brazil is the best produced and that the government of Brazil is concerned as to how it can compete with plantation rubber and get back the revenues this natural resourse formerly yielded. The Brazilian Rubber Refining Co. has built a washing plant at Para and is now ready to ship up river fine in crepe form. The crude rubber will be washed there where labor is only twenty-five cents a day. There will also be a saving in duty.

To the question "What assurance will the manufacturer have that he will get the best grade of rubber?" Mr. Wood replied that the Brazilian government is watching the industry very closely to reap the benefit of the increased revenue which guarantees quality. A shipment of 300 tons is now enroute. The washed rubber will be free from dirt, nails or splinters and can be put right on the mills. It is shipped in boxes of good hard quality. The same interests are putting up an additional factory to manufacture rubber goods and particularly tennis shoes. Fabric will be supplied from the cotton mills at Rio de Janeiro.

Mr. Wood believes that the tire business is going to be bigger than ever but that the manufacturers will come to the "No mileage guarantee basis."

R. G. Conant of Brighton Mills is of the opinion that there are no surplus stocks of cotton goods and therefore that the volume of business for next year will be great. Because reports indicate that the cotton crop both in Egypt and the United States is less than 50 per cent of last year he feels that the price of cotton will be well maintained and that the price of the finished product will rise accordingly.

M. W. Rozar of the Bibb Mfg. Co., and Mr. F. L. Barnwell of the Jenckes Spinning Co., talked along similar lines.

L. E. Beitler of the Barrett Co., gave an interesting account of the enormous undertaking of his company in research work in synthetic rubber. Dyestuffs trade is increasing and splendid results are expected for next year.

President W. W. Wuchter, of the Nebraska Tire & Rubber Co., urged members to interest their various Chambers of Commerce in questions affecting production, consumption and employment. He believes the same good results will follow that now obtain in Omaha. He said that the people of Omaha are using Omaha made tires principally. He deplored the high prices of foodstuffs in Omaha while the farmer is getting only 17 cents a bushel for corn.

Associate Members Organize

At the newly formed Associate Members meeting Edw. G. Gereke of St. Louis was elected Permanent Chairman and A. C. Eide of the American Zinc Co., Assistant Chairman. The following resolutions were adopted:

> We the Associate members of the Mid West Rubber Manufacturers Association, desiring to make the Association a complete success, and also desiring to increase the attendance at the regular monthly meeings, have expressed the following intentions at a special meeting held October 11:
>
> That Associate members are to refrain from approaching the manufacturers at these meetings and soliciting business.
>
> We do this in the belief that regular members appreciating our desire to help and not hinder will in turn reciprocate the courtesy by remembering their needs and voluntarily call on the Associate members for any interviews that may be in order.
>
> We further suggest that the Manufacturers help us to make these meetings better attended and more pleasant by not failing to show their resentment, should any of our members fail to observe this voluntary rule.
>
> It is further the interest of the Associate Members to bring such news of material markets, so as to make these meetings a source of reliable information.
>
> Trusting that we will get the cooperation of every Regular and Associate member, we remain,
>
> ASSOCIATE MEMBERS

At the luncheon F. W. Knoke of the American Zinc Lead & Smelting Co., St. Louis, spoke on the resolutions and was followed by Thos. Follen, president of The Lion Tire & Rubber Co., La Fayette, Ind., J. B. Gabeline, Standard-Four Tire Co., Keokuk, Iowa, and others.

At the meeting of the Board of Directors, The McWade Tire & Rubber Co., of Garrettsville, Ohio, was elected to membership. A telegram from Paul Parker that he could not attend on account of local meetings was read.

The next meeting will be held November 8.

Perfect Package Month

All trades and industries have been asked to cooperate in the "Perfect Package Movement" to be inaugurated by the railroads, steamship lines and express companies in the United States and Canada, in November, which has been designated as "Perfect Package Month".

The purpose of the movement is to stimulate further public interest in good packing of shipments and to enable the carriers to improve the transportation service of the country. During November an examination of all shipments sent by freight or express, will be conducted, to obtain information as to the best shipping methods carried on by the various trades and industries.

In every city and town, the railroad and express people will form campaign committees, to cooperate with local shippers' associations, in carrying out the plans announced for "Perfect Package Month". "Exception Reports" will be made out for all faulty shipments discovered and these reports will be sent to the shippers' association for tabulation, to ascertain how high a percentage for "Perfect Packages", the shippers of that city have attained.

Comparisons of the records made by the various cities during November will be announced at the conclusion of the drive. The entire working forces of the railroad and express carriers, comprising some 2,000,000 men, will aid in the movement. The railroads, through the American Railway Association, composed of practically all of the railroads in the country, are pushing the campaign, as a means of raising the standard of the service, while the express agents are also getting ready to interest shippers in the undertaking.

Trade With Spain

The American Chamber of Commerce in Spain intends to edit in the early part of December a special number of its Monthly Bulletin and has requested us to publish this notice for the information of these who might wish to avail themselves of its special edition and contract for advertising space therein. Full particulars may be had from the American Chamber of Commerce in Spain, Rambla de los Estudios 8, Barcelona, or from Eugene L. Perea, c/o. Messrs. Boera Brothers, Staten Island, Ferry Terminal Building, New York City.

Liberal Price Reductions

A. Schraders Sons of Brooklyn, New York announce the following reduction in prices to become effective after Nov. 1: Schrader Universal Tire Pressure Gauge from $1.50 to $1.25; Schrader Universal Truck Tire Gauge from $2.00 to $1.75; Schrader Universal Valve Caps from 40 cents a box of five to 25 cents; Schrader Universal Valve Insides from 40 cents a box of five to 30 cents.

Progress in Automotive Industry

In August, normally the lowest seasonal level in the automotive industry, sales of parts and equipment to car and truck manufacturers moved forward more than one per cent beyond the July figure.

This steady progress is the significant feature of the monthly survey of conditions in the automotive industry made public today by the Motor and Accessory Manufacturers Association.

Purchases of parts, units and equipment by automobile passenger car and motor truck manufacturers from three hundred parts and accessory manufacturers show an increase of 1.31 per cent. In July the increase was 1.68 per cent and in June the curve had shown a decrease of 15.19 per cent.

During August, the automotive industry also showed betterment in two other fundamental respects—the total past due accounts decreasing 17.06 per cent and the total of notes outstanding dropping 5.30 per cent.

The percentage changes for the last eight months follow:

MONTH	PER CENT CHANGE*	PER CENT CHANGE**	PER CENT CHANGE***
February	66.15 Inc.	17.07 Dec.	39.08 Inc.
March	93.30 Inc.	16.57 Dec.	16.38 Dec.
April	32.93 Inc.	4.49 Dec.	5.94 Inc.
May	00.13 Inc.	15.64 Dec.	16.77 Dec.
June	15.19 Dec.	4.79 Inc.	10.37 Dec.
July	1.68 Inc.	10.79 Inc.	7.90 Dec.
August	1.31 Inc.	17.06 Dec.	5.30 Dec.

* Purchases of parts, units, equipment, etc. by automobile passenger car and motor truck makers from 300 parts and accessory manufacturers by months—per cent change.

** Totals of past due accounts reported—per cent change.

*** Totals of notes outstanding—per cent change.

Star Branch Changes

S. W. Reese, formerly representative of the Oldfield Tire Company in the Kansas City district, will succeed H. T. Roseland as branch manager in this district for the Star Rubber Company, Inc., whose factory and offices are located at Akron, Ohio.

Mr. Reese's many business friends and associates will no doubt be pleased to hear of this change and will wish him success in his new field.

Trent Rubber Plant Sold

Counselor Edgar W. Hunt of Trenton, N. J., representing creditors, has purchased at receiver's sale the plant of the Trent Rubber Company on Enterprise Avenue, Trenton, for $100,000. The plant is in operation and it is the intention to keep it running. The sale will have to be confirmed by the United States Court.

At the time the plant passed into the hands of John O. Bigelow, of Newark, receiver, September 29, last, the liabilities were approximately $300,000. Mr. Bigelow stated that this sum remains about the same today.

Rubber Floats for Bathers

(Special Trenton Correspondence)

Rubber air floats for bathers are now being made by the Globe Rubber Tire Manufacturing Company, Trenton, N. J.

Mill Notes

The Keds Division of the National India Rubber Co., Bristol, R. I., one of the United States Rubber system, resumed operations on August 22.

The Denman-Myers Cord Tire Co.'s plant at Warren, Ohio, which began operations last October expect to reach a production of 500 tires per day by next spring. Their output is increasing every week.

The Falls Rubber Co., Cuyahoga Falls, Ohio, is reported as working one shift with a force of 100 men, as against two shifts with 300 men at their peak in 1919.

The Kelly-Springfield Tire Co. is reported as producing 3,500 tires per day of which 1,000 are being made at their new plant at Cumberland, Md. They are gradually slowing down their plant at Wooster, Ohio, preparatory to transferring operations to the new plant at Cumberland.

The plant of the Electric Hose & Rubber Co., Wilmington, Del., shut down August 22 for two weeks for annual repairs.

Gordon Disposes of Real Estate Lease

The receivers of The Gordon Tire & Rubber Co., Canton, Ohio, are reported to have sold the lease of property held by them at the southeast corner of Fourth Street and Cleveland Avenue, N. W., Canton, at a price yielding a substantial profit to the company.

Tire Fabric Mill Resumes

The Beaver Mills of North Adams, Mass. reopened early in October after being shut down for several months. They manufacture high grade automobile cord fabric.

K. & S. Tire Sales Increase

Sales of tires and tubes of the K. & S. Tire & Rubber Goods, Ltd., Toronto, Canada, for the first six months of 1921 show an increase over the same period of last year of 23.7 per cent. July sales showed an increase of 137 per cent over July 1920 and our sales for August are about 200 per cent over sales during August 1920.

Kelly Heads Quaker City Tire Sales

The Quaker City Rubber Co., Philadelphia, Pa., recently announced the appointment of F. N. Kelly to the position of director of the tire sales division. A. W. Thomas will be associated with Mr. Kelly in the marketing of the company's products. Announcement is also made to the effect that New York offices have been opened at 1664 Broadway.

U. S. Motor Truck Declares Dividend

F. J. Alvin general manager of the United States Motor Truck Co., Cincinnati, Ohio, announces that the company declared its regular quarterly dividend of 1¾ per cent on October 4.

Rubber Importations for September

Importations of crude rubber into the United States during the month of September 1921 show a considerable increase over importations for September 1920 according to the recently issued report of the Rubber Association of America. The statistics showed importations for September 1921 to be 15,088 tons while those for September 1920 amounted to 11,636 tons. Total importations for the first nine months of 1921 ending September 30 amounted to 119,466 tons, a considerable decrease when compared to 192,973 tons which was the amount imported during the corresponding period of 1920.

Following are the importation statistics in detail:

PLANTATIONS

From	Tons
Batavia	442
Belawan-Deli	600
Colombo	3,194
Hamburg	262
Liverpool	6
Malacca	108
Penang	20
Pt. Swettenham	112
Rotterdam	3,997
Singapore	5,817
Sourabaya	95
	14,653

AFRICANS

From	Tons
Antwerp	5
Liverpool	10
	15

CENTRALS AND GUAYULE

Centrals (Mexico and Central America)	4
Guayule (Mexico)	—
	4

PARAS

Iquitos	31
Manaos	223
Para	162
	416

GUMS, WASTE RUBBER, ETC., IMPORTED FROM VARIOUS SOURCES

	Tons
Waste	99
Balata	41
Miscellaneous Gums	211

COMPARISON 1920-1921

	Sept. 1920	Sept. 1921	Total Importations nine months ending, September 30. 1920	1921
Plantations	10,974	14,653	172,802	110,146
Paras	459	416	14,973	8,412
Africans	99	15	3,756	772
Central	8	4	673	75
Guayule	74	—	734	58
Manicoba and Matto Grosso	22	—	35	3
	11,636	15,088	192,973	119,466

ARRIVALS PLANTATIONS FOR SEPTEMBER, 1921, SHOWING PORTS OF ORIGIN AND ARRIVAL

From	Arrived at	Tons
Batavia	New York	383
Batavia	Baltimore	59
Belawan-Deli	New York	600
Colombo	New York	3,194
Hamburg	New York	262
Liverpool	New York	6
Malacca	New York	108
Penang	New York	20
Port Swettenham	New York	112
Rotterdam	New York	3,997
Sourabaya	New York	95
Singapore	New York	5,664
Singapore	San Francisco	31
Singapore	Baltimore	122
		14,653

ARRIVALS OF PLANTATIONS BY PORTS

Atlantic Ports		
New York	14,441	
Baltimore	181	
		14,622
Pacific Ports		
San Francisco	31	
		14,653

News of the Rubber Association

A Monthly Statistical Plan—Tire Division Holds Meeting—New Cost Accounting Committee—Successful Meeting of Tire Division—Interesting Figures on Inventory, Production and Shipment

A Monthly Statistical Plan

The Rubber Association has been requested to ascertain from all members of the Hard Rubber Division of the Association, their attitude with respect to participation in a monthly statistical plan covering gross sales of hard rubber goods.

The plan contemplated is similar to those in operation in the Tire Manufacturers' Division. Mechanical Rubber Goods Manufacturers' Division, Rubber Proofers' Division, etc., and if put into operation will be conducted under a code system, which will preclude the possibility of the figures of individual rubber manufacturers becoming public property, as the key to the code will be available to only two members of the Association's staff.

Developments in connection with this matter are being watched with interest, as it is believed that it will serve to indicate the common view of statistics held by members who have not had any experience with statistical plans.

Meeting of Tire Division

The meeting of the Tire Manufacturers' Division, held in New York on September 22nd, was very well attended, there being present representatives of forty-four members of the Tire Manufacturers' Division.

In addition to the subjects of mileage adjustments and protection against price decline, a general review of the action taken by the Executive Committee in connection with several specific matters during the past year or so was had, and the round-table discussion by those present proved to be very beneficial and interesting to all concerned.

At the present time, it is contemplated to hold the next meeting of the Tire Manufacturers' Division, as a whole, in January, 1922, and it is hoped that even a greater representation will be had at that time than at the meeting held on September 22nd.

Additions to Firm Membership

At the September meeting of the Board of Directors the following companies were formally elected to Firm Membership in The Rubber Association:

Usow Rubber Manufacturing Company, Port Washington, Wis. Firm Representative—Mr. A. D. Usow.

Nebraska Tire & Rubber Company, Omaha, Nebraska. Firm Representative—Mr. W. W. Wuchter.

The New Cost Accounting Committee

The organization meeting of the Cost Accounting Committee was held on September 27th at the office of the Rubber Association.

A general discussion as to the potential activities of the Committee constituted of executive accounting officers, resulted in the conclusion that it would be advisable to broaden the scope of the work to include not only cost study, but all phases of accounting. The Committee was of the opinion that there would be many accounting problems which could be effectively dealt with by a cooperative body, and as the personnel of such a Committee would doubtless be identical to that of the Cost Accounting Committee, it seemed to be logical to increase the field of endeavor for the Cost Accounting Committee. Such action naturally was accompanied by a change in the name of the Committee so as to designate it is the "Accounting Committee" instead of "Cost Accounting Committee". Therefore, the Board of Directors of the Association was requested to formally recognize the Accounting Committee as such, and also to authorize an increase in its personnel to not more than twenty-five members, if additions to the present personnel were desired.

At its meeting on September 29th, the Board approved these changes.

The Committee arranged for each member to prepare a memorandum outlining the functions of the cost accounting department in his Company and its relation to the enterprise as a whole; the definition of factory cost, with a classification of the burden and other elements entering into factory cost; and the underlying principles covering the application of factory burden; this work to be in anticipation of an early meeting of the Committee for discussion of specific problems.

Stanwood Rubber Co. Sold for $360,000

Attorney Manning Stires, of 220 West 42nd street, New York, and Stanley P. Woodward, owner of the Gillette Rubber Company, of Wisconsin, have purchased the plant of the Stanwood Rubber Company, situated between Elizabeth and Newark, N. J. The sale took place before Vice Chancelor Baches at Elizabeth. The plant was sold for $360,000, which is subject to a mortgage of $300,000.

The sale was accepted by the court as a preliminary step to the reorganization of the plant and an ultimate resumption of business.

Testimony brought out that $300,000 in mortgage had been subject to foreclosure, a year's interest having been due. The mortgage is held by the Union Trust Company, of Jersey City, N. J. The total debt of the old concern was placed at $610,000, of which the Gillette Rubber Company has a claim for $55,000.

The first step of the new owners will be to issue preferred stock to the amount of $500,000. The next issue will be in debentures stock to the amount of $175,000, to be followed by an issue of second preferred stock to the amount of $151,000. Five hundred thousand shares of common stock will be placed on the market with no par value.

The debentures issue will bear no interest and there will be no fixed time for payment.

The proved claims of creditors amount to $309,000. Creditors holding $286,500 claims consented to the reorganization. The property of the Stanwood company was appraised at $1,500,000.

Tyson Secretary of British Club

Walter Tyson has been appointed Secretary and organizer of the Rubber Club of Great Britain with offices at 29A, Charing Cross Road, London.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes— Solid Tires, Etc.

November, 1920, to and including August, 1921

"Production" and "Shipments" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch or on a consignment basis, or abroad.

(Compiled by The Rubber Association of America, Inc.)

MONTH	PNEUMATIC CASINGS			INNER TUBES			SOLID TIRES		
	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
November, 1920	36	5,880,016	649,742	806,023	40	6,131,935	742,815	920,938	11	298,875	21,355	34,217
December, 1920	43	5,508,380	506,111	1,327,153	43	5,786,929	508,446	1,481,285	12	303,473	16,297	40,828
January, 1921	45	5,319,605	703,430	965,417	47	5,586,163	740,824	1,042,617	12	303,753	21,220	29,116
February, 1921	45	5,193,018	819,892	1,073,756	46	5,415,464	916,627	1,129,881	12	304,374	23,365	29,599
March, 1921	46	4,597,103	1,163,314	1,614,651	48	5,044,861	1,346,483	1,643,690	12	283,800	28,710	43,926
April, 1921	49	4,527,445	1,651,418	1,785,951	51	4,916,772	1,762,122	1,983,571	12	269,985	28,859	42,080
May, 1921	59	4,451,668	2,100,917	2,085,882	57	4,751,880	2,210,040	2,342,567	12	264,633	35,156	40,122
June, 1921	63	4,154,456	2,313,265	2,643,850	60	3,835,098	2,359,928	3,232,673	11	240,336	28,395	49,867
July, 1921	56	3,892,037	2,570,524	2,757,581	61	3,122,815	3,020,981	3,603,248	11	220,003	35,123	55,678
August, 1921	66	3,934,583	3,043,187	2,894,442	64	3,649,319	4,430,152	3,804,060	11	216,367	55,694	66,866

Verdict by Default

The Marlboro Cotton Mills, which had brought suit against the Firestone Tire & Rubber Company of Akron, Ohio, in Marlboro County, South Carolina, received a verdict in its favor for $121,392.05.

It was stated by Claud Gore, president of the cotton mill company, that in 1919 the Marlboro Cotton Mills contracted to sell the Firestone Tire & Fabric Company a lot of tire fabric at $1.55 a pound. When the decline in prices came in 1920, it was alleged, the Firestone company refused to accept a large part of the fabric contracted for.

By reason of the decline in price of 65 cents a pound and the failure of the Firestone Company to take the fabric the cotton mills claimed a loss of the amount of the verdict. The Firestone company was not represented in the court and ignored the trial, claiming that the South Carolina court had no jurisdiction in the case. The judge presiding so held and directed the verdict by default for the amount claimed.

Culp Executives at Cleveland

George K. Culp, Silvis Galoppo, Murray Barrett and Heber McDonald of the New York Culp-Plan organization as well as associate dealers from all parts of the country were in attendance at the National Tire Dealers Association Convention October 18 to 20 at Cleveland.

On Wednesday, the second of the convention, a tube rolling contest was held in front of the Cleveland City Hall for a silver cup offered as a prize by Mr. Culp, and was witnessed by Mayor Fitzgerald and many Cleveland city officials. Moving pictures were made of the event by some of the leading movie companies for their current news events films.

Receiver for Rubber Corporation

Edward R. Duer has been appointed receiver in equity of the Rubber Corporation of America in an action filed by the Equitable Trust Company, holder of a promissory note made last January for $70,043. The complaint states that the liabilities of the company are about $900,000 and the assets approximately $1,030,000.

The object of the receivership, it added, was to conserve the assets of the company so that either a reorganization of its affairs could be effected in conjunction with the Empire Tire and Rubber Company of Trenton or that the assets might be liquidated.

Porter Rubber Plant Sold

The Porter Rubber company plant, located near Salem, Mass., has been sold to L. W. Hicks, of Pittsburgh, for $73,400, by Sheriff Gomer Lewis. The sale included the entire equipment of the company.

The plant was sold to satisfy an $85,000 judgment entered in the common pleas court in favor of L. W. Hicks against the company.

Goodyear's "Get-Together" Meeting

The first "Get-together" Meeting of the executives of the Goodyear Tire & Rubber Co., of Akron, since E. G. Wilmer was elected president of the company, was held at the plant on the evening of October 6. President Wilmer said that despite pessimistic fears existing in some quarter he believed the Goodyear company was going to have "a mighty decent winter." He said that the sales for the first nine months of 1921 had exceeded those for the first nine months of 1920, notwithstanding the fact that sales for the first six months of 1920 had been the greatest in the company's history.

E. G. Wilmer

Vice President and Factory Manager Paul W. Litchfield, Sales Manager L. C. Rockhill of Akron and Vice President C. H. Carlisle of the Goodyear Canadian Company at Toronto were among the other speakers. Personnel Manager Harry Blythe was toastmaster at the dinner.

Lawrence Resigns From Goodrich

J. C. Lawrence, director of branch operations for the B. F. Goodrich Co., Akron, has resigned in order to engage in business in New York.

Diversified Industries for Akron Urged

W. D. Shilts, of the Goodyear Tire & Rubber Co., addresed a luncheon of the Akron Real Estate Board October 3 on the subject "Diversified Industries for Akron." He said 84 per cent of Akron's industrial activity was in the rubber industry and he urged a campaign for new industries as tending to help the industrial condition of the city.

The Travelers' Rubber Company

The Travelers' Rubber Company, Bethlehem, Pa., will install new machinery and equipment at its plant to cost about $25,000.

The Howe Rubber Company

The Howe Rubber Company, manufacturers of automobile tires recently incorporated in Illinois, for the purpose of carrying on an automobile business in that State and elsewhere. The capital stock is $4,000,000, of which amount $853,200 is to be employed in the business to be carried on in Illinois, where the principal place of business is located at 134 LaSalle street, Chicago.

John Tenney, Jr., of Plainfield, N. J., is named as president of the corporation and Ambrose Hardenbergh of New Brunswick, N. J. is secretary. The Illinois representative is W. T. Alden of the Chicago address.

Bechberger Resigns From Fisk

William A. Bechberger, in charge of fabric purchases for the Fisk Rubber Co., 52 Vanderbilt Avenue, New York, has tendered his resignation to be effective not later than January 1. He has been with the Fisk Company both in New York and Chicopee Falls for 14 years. He expects to take a year's vacation.

Hudson Tire Co. Wins Suit

The Federal District Court of New York in the case of the Hudson Tire Company against the Hudson Tire & Rubber Corporation held that the use of the original name by a second party leads to confusion, as it is an infringement of the complainant's rights.

Seeking a preliminary injunction, the Hudson Tire Company, a new Jersey corporation, petitioned that the defendant be restrained from manufacturing, selling or dealing in tires bearing the description "Hudson." The plaintiff claims incorporation January 2, 1915, and that a year subesquent it reincorporated. The defendant, it was alleged, did not incorporate until April 19, 1920, and immediately after its incorporation placed upon the market automobile tires bearing a name similar to the original manufacturer's.

Encouraging Report From General Tire & Rubber

The General Tire & Rubber Co., of Akron, report that their sales for the first eight months of 1921 were 30 per cent ahead of their 1920 sales for the corresponding period; also that 82 per cent of their "Class A" distributors show increased sales both in tires and dollars over their 1920 sales.

The Heels of Achilles

The new factory building at the plant of the Achilles Rubber & Tire Company, Binghamton, N. Y., will be equipped with machinery for the manufacture of rubber heels. This is a new line in the production of this company, tires being their main product. President Harry J. Smith announces that the further expansion of the company is now assured.

MARKETS

Cottons, Yarns and Fabrics

New York, October 20, 1921

Domestic and foreign conditions combined to unsettle the cotton market early this week and the reaction from the dizzy height reached earlier in the month took all the snap out of the cotton goods market. Uneasiness over the financial developments in Germany started the decline and on top of this war the disturbing effect of the proposed railroad strike. Cotton is now selling about 4 cents a pound below the high price reached early this month and the present price is about 6 cents above the low price of last June. The next census report on ginning will be issued on October 25.

Cotton prices as of October 20 follow:

	Open.	High.	Low.	Close.
Oct.	18.75	18.75	18.25	18.25
Dec.	18.90	18.92	18.83	18.34@18.38
Jan.	18.75	18.75	18.10	18.13@18.21
March	18.55	18.55	18.00	18.03@18.07
May	18.23	18.23	17.60	17.65@17.73
July	17.75	17.75	17.20	17.20

DRILLS—SHEETINGS—DUCKS

The quiet trade in cotton goods reflects the natural unsettlement following the decline in cotton. A timidity born of the fear that the price of raw material may go much lower keeps large operators from buying. In the sheeting market there is no inclination to operate freely yet there is a very general feeling that stocks with jobbers and manufacturers are low and that buyers will be compelled to come into the market before long.

The burlap market continues quiet but very steady in view of the rise of the past month.

It has been rumored for some time that cotton duck to the amount of 200,000,000 yards is being held by the war department. This has been denied by the Quartermaster Department of the Army and the statement made that the department holds about 30,000,000 yards.

It has also been stated that the department is about to offer 10,000,000 yards of duck for resale. This is true but the duck will be marketed in small quantities from various depots throughout the country and will not be sold in bulk. This will leave a balance to be sold of about 20,000,000 yards.

EGYPTIAN COTTON

The yield of Egyptian Cotton for the season of 1920-1921 was 4,876,500 cantars against 5,642,560 cantars in the previous year. Shipments from Alexandria to Great Britain amounted to 220,223 bales as compared with 408,063 bales in 1919-1920. The exports to the United States showed a big drop the figures being 49,722 bales against 291,496 bales. Shipments to all ports were 428,470 bales as compared with 841,707 bales. The stock in Alexandria at the end of the season was 1,848,500 cantars against 436,000 cantars a year ago.

TIRE FABRICS (Square Woven)

17¼-ounce Egyptian uppers, combed, ... lb.	.80	@	—
17¼-ounce Egyptian uppers, carded ..... lb.	.70	@	.75
17¼-ounce Sakellarides, combed ..... lb.	.85	@	.90
17¼-ounce Sakellarides, carded, ... lb.	.75	@	.80
17¼-ounce Peelers, combed, lb.	.75	@	.80
17¼-ounce Peelers, carded, lb.	.54	@	.55

CORD FABRICS

Combed Sakellarides ..... lb.	.85	@	.90
Carded Sakellarides ..... lb.	.80	@	.85
Combed Peeler ..... lb.	.77	@	—
Carded Peeler ..... lb.	.65	@	—
Combed Egyptian uppers ... lb.	.80	@	—
Carded Egyptian uppers .... lb.	.75	@	—

DUCKS

Belting (pound basis) ..... lb.	.39	@	—
Hose (pound basis) ..... lb.	.29	@	—
*Enameling ..... lb.	.39	@	.46
Shoe Ducks ..... lb.	.40	@	—
Single filling ..... yd.	.16	@	.20
Double filling ..... yd.	.20	@	.21

DRILLS

37-inch 3.25-yard ..... yd.	.12¼	@	—
37-inch 2.75-yard ..... yd.	.12¾	@	—
37-inch 3.00-yard ..... yd.	.13¼	@	—
37-inch 3.50-yard ..... yd.	.11½	@	—
37-inch 3.95-yard ..... yd.	.10½	@	—

OSNABURGS

30-inch 7-ounce	.10	@	—
40-inch 7-ounce	.12	@	—

SHEETINGS

40-inch 2.50-yard ..... yd.	.14½	@	—
40-inch 2.85-yard ..... yd.	.12¾	@	.13
40-inch 3.15-yard ..... yd.	.14	@	—
40-inch 3.60-yard ..... yd.	.12½	@	—
40-inch 3.75-yard ..... yd.	.11	@	—
40-inch 4.25-yard ..... yd.	.10	@	—

BURLAPS (Carload Lots)

7 -ounce 40-inch ..... yd.	4.05	@	—
7½-ounce 40-inch	4.15	@	—
7¼-ounce 45-inch	4.00	@	—
10 -ounce 40-inch	5.60	@	—
10 -ounce 36-inch	4.10	@	—
8 -ounce 40-inch	4.20	@	—
10 -ounce 45-inch	6.25	@	—
10½-ounce 40-inch	5.75	@	—

ALEXANDRIA

Statistics for the week ending September 23, 1921

	ARRIVALS Cantars	EXPORTS (Bales) England	Con'nt	America	TOTAL EXPORTS Cantars	STOCK Cantars
This week	93,436	7,553	8,219	7,629	177,329	1,699,479
Same week 1920	61,787	1,350	754	——	16,143	484,923
" " 1919	93,382	13,734	1,068	2,572	130,305	392,148
Since Sept. 1, 1921	227,173	21,477	15,407	10,889	362,694	——
Same time 1920	130,884	2,872	2,939	——	44,163	——
" " 1919	270,104	29,994	2,424	10,376	320,956	——

The Cotton Wrangle

As a result of the controversy between the United States Shipping Board and the British Ship owners, which arose last summer over the contract for the movement of Egyptian cotton from Alexandria to the United Kingdom and the United States, there has resulted what promises to be a very bitter freight war. The situation has become very tense and there is every indication that the Shipping Board is determined to secure part of the carrying business for vessels of American registry in a trade which has been monopolized by the British lines.

The controversy of the Shipping Board with the Liverpool lines, a conference in which the Cunard, Ellerman, Prince, Moss and Pappyani lines were participants, was precipitated by the refusal of the Alexandria Produce Association to accept the tender of the Shipping Board for the movement of Egyptian cotton for the next year, although it was substantially below that offered by the British.

A representative of the State Department, upon being advised of the rejection, threatened to have the provisions of the Merchant Marine Act of 1920, empowering the Shipping Board to bar vessels of companies discriminating against American ships, brought into force. Offers of compromise on the part of Capt. Frank E. Ferris, representing the Shipping Board, followed, but nothing developed. After negotiations had progressed for some time the Shipping Board decided to break.

Cotton Supplants Rubber

The cultivation of rubber has been completely supplanted in the States of Amazone and Matto Grosso, in Brazil, it is reported, by the cultivation of cotton, for which latter crop the ground is now being prepared. The reason given for the abandonment of rubber is the high cost of production and transportation.

Selling Agency Transferred

The International Cotton Mills announce that it is planned on Jan. 1, 1922, to transfer their selling account to Lawrence & Co.

A large part of the organization of the J. Spencer Turner Co. will continue to sell the goods with Lawrence & Co. and John E. Rousmaniere, the president of the J. Spencer Turner Co., will become, on that date, a partner in Lawrence & Co.

Until Jan. 1, the selling of the goods made by the International Cotton Mills will be carried on as usual by the J. Spencer Turner Co.

Chemicals and Compounding Materials

THE GENERAL MARKET—NEW YORK, OCTOBER 20—Each week continues to show a slight improvement in demand and general confidence in the market for industrial chemicals. General conditions, of course, do not permit of any very rapid movement of products but the constantly better tone is very encouraging to all factors in the trade. A particularly encouraging feature is the improvement in the textile trade which must necessarily result in a greater demand for chemical materials. Consumers are showing a tendency to buy more freely and in a degree to anticipate the future. It is not unlikely that the general price levels for futures of many items will be higher in the weeks to come. Prices have strengthened and slight advances have been registered in many important products.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .95 @	1.00
Aniline oil, bulk basis	lb.	.18 @	.26
Excellerex	lb.	.55 @	.65
Formaldehyde-aniline	lb.	.55 @	.60
Hexamethylene-tetramine (powdered)	lb.	.75 @	.80
Paraphenylene-diamine	lb.	— @	—
Thiocarbanilid	lb.	.55 @	.60
Vulcocene	lb.	.35 @	..

Inorganic

Lead, dry red, bbls.	lb.	.08 @	.08¼
Lead, sublimed white	lb.	.07¼ @	.07½
white, basic carbonate	lb.	.06½ @	.07¼
Litharge, commercial, bbls.	lb.	.07½ @	.07¾
Lime, hydrated	lb.	.03 @	—
Magnesia, calcined, extra light	lb.	.60 @	.65
heavy	lb.	.06 @	.07
Magnesite, powdered	ton	50.00 @	65.00

COLORS

Blacks

Bone, powdered	lb.	.06½ @	.08½
Carbon black	lb.	.10½ @	.20
Drop	lb.	.07½ @	.16
Ivory	lb.	.15 @	.45
Lampblack	lb.	.17 @	.45

Blues

Prussian	lb.	.50 @	.60
Ultramarine	lb.	.10 @	.35
Cobalt	lb.	.27 @	.35
Rubber maker's blue	lb.	— @	—

Browns

Iron oxide	lb.	.04 @	.05
Sienna, Italian, raw and burnt	lb.	.06 @	.07
Umber, Turkey, raw and burnt	lb.	.05 @	.07

Greens

Chrome, light, c. p.	lb.	.30 @	.32
medium	lb.	.35 @	.36
dark	lb.	.36 @	.45
oxide	lb.	.55 @	.65

Reds

Antimony, crimson	lb.	.40 @	.50
golden	lb.	.25 @	.30
red	lb.	.23 @	.26
Indian, pure	lb.	.12 @	.15
Oxide, copperas, pure	lb.	.14 @	—
reduced	lb.	.11½ @	.12½
Para toner	100 lb.	1.40 @	—
Toluidine toner	lb.	2.75 @	3.10
Tuscan	lb.	.17½ @	.30
Venetian	lb.	.03½ @	.06½
Vermillion, English, quicksilver	lb.	.70 @	—
domestic	lb.	.25 @	.30

Whites

Albalith	lb.	.06 @	.06¼
Aluminum bronze	lb.	.60 @	.65
Lithopone, Beckton white	lb.	.06 @	.06½
Lithopone, domestic (factory)	lb.	.06 @	.06½
Zinc oxide, American Horse Head Special	lb.	.08 @	.08½
XX red	lb.	.07½ @	.08
Zinc oxide, French process, White seal	lb.	.11 @	.11¼
Green seal	lb.	.09¾ @	.10¼
Red seal	lb.	.08¾ @	.09¼

Yellows

Cadmium sulphide	lb.	1.25 @	1.50
Chrome, light, c. p.	lb.	.18 @	—
dark	lb.	.18 @	—
medium	lb.	.18 @	—
Ocher, French	lb.	.02½ @	.03½
domestic	lb.	.02¾ @	.03¼
Zinc chromate	lb.	.33½ @	—

COMPOUNDING INGREDIENTS

Aluminum flake	ton	.29½ @	—
hydrate	ton	22.00 @	25.00
Ammonium carbonate, powdered	lb.	.06 @	.09
Barium dust	ton	100.00 @	—
Barytes, Southern off-color	ton	20.00 @	—
Western, prime white	ton	23.00 @	—
Basofor	lb.	.04 @	—
Beta-naphtol, technical	lb.	.33 @	—
Blanc fixe, dry, f.o.b. works	lb.	.03½ @	—
Chalk, precipitated, extra light	lb.	.03½ @	.04¼
heavy	lb.	.02½ @	.03¼
Clay, China, domestic	ton	7.50 @	9.00
imported	ton	16.00 @	24.00
Dixie	ton	22.00 @	35.00
Blue Ridge	ton	22.00 @	32.00
Fuller's Earth, powdered	ton	22.00 @	25.00
Fossil flour	ton	60.00 @	..
Glues, extra white	lb.	.30 @	.40
medium white	lb.	.22 @	.28
cabinet	lb.	.18 @	.32
cabinet low grade	lb.	.15 @	.18
common bone	lb.	.09 @	.14
Graphite flake, bbls.	lb.	.10 @	—
powdered	lb.	.05 @	—
Ground glass, fine	lb.	.03½ @	.04
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	65.00 @	—
Liquid rubber	lb.	.15 @	—
Rotten Stone	lb.	.02½ @	.04½
Silica (aluminum)	ton	23.00 @	25.00
Soapstone, powdered	ton	15.00 @	20.00
Starch, powdered corn	cwt.	2.08 @	—
Talc, domestic	ton	18.00 @	20.00
French	ton	22.50 @	30.00
French, high grade	ton	40.00 @	45.00
Italian	ton	40.00 @	45.00
Terra Alba, American No. 1	cwt.	1.85 @	2.00
American No. 2	cwt.	1.25 @	..
Tripoli	ton	— @	—
Whiting, commercial	cwt.	1.05 @	1.10
Quaker	ton	13.00 @	15.00
English cliffstone	cwt.	1.60 @	2.00
glider's bolted	cwt.	1.20 @	1.35
Paris white American	cwt.	1.30 @	1.40
Zinc Oxide— 5 per cent leaded		.07¼ @	.07⅝
10 per cent lead sulphate	lb.	.07 @	.07½
20 per cent lead sulphate	lb.	.07 @	.07½
35 per cent lead sulphate	lb.	.07 @	.07½

MINERAL RUBBER

Gilsonite	ton	70.00 @	—
Genasco (c. l. factory)	ton	50.00 @	—
(l. c. l. factory)	ton	52.00 @	—
Hard hydrocarbon	ton	33.00 @	45.00
Soft hydrocarbon	ton	30.00 @	40.00
M. R. X.	ton	— @	—
Pioneer (c. l. factiry)	ton	34.00 @	65.00
Raven M. R.	ton	— @	—
320 M. P. hydrocarbon (c. l. factory)	ton	50.00 @	55.00
(l. c. l. factory)	ton	57.50 @	—
300/310 M. P. hydrocarbon (c. l. factory)	ton	40.00 @	—
(l. c. l. factory	ton	45.00 @	—
Syntpro, granulated, M. R. (factory)	ton	64.50 @	—

SOFTENERS

Acids

Acetic, 28 per cent	lb.	.02¼ @	.03
Carbolic (phenol)	lb.	.09½ @	.16
Cresylic, 97 to 99 p. c. pale	gal.	70 @	.75
Muriatic, 20 degrees	cwt.	1.40 @	2.00
Nitric, 36 degrees	cwt.	5.50 @	6.50
Sulphuric, 66 degrees	ton	18.00 @	20.00
60 degrees, bulk	ton	11.00 @	12.00
Tartaric, crystals	lb.	.35 @	—

Alkalies

Caustic soda, 76 p.c.	cwt.	4.00 @	4.15
soda ash, 58 p. c.	cwt.	2.10 @	2.15

Oils

Castor, No. 3, bbls.	lb.	.10½ @	—
Corn, crude, bbls.	lb.	.09 @	.09½
refined	lb.	.10 @	.10½
Chinawood, bbls.	lb.	.13½ @	.13¾
Cottonseed,	lb.	.10¼ @	—
Glycerine, c. p. drums	lb.	.14 @	.15
Linseed, carload spot	gal.	.69 @	—
bbls.	gal.	.72 @	—
Palm, Niger	lb.	.06½ @	—
Lagos	lb.	.07½ @	.07¾
Peanut, domestic crude	lb.	.09½ @	.10
Pine, steam distilled over 930° sp. gr.	gal.	1.00 @	1.35
Rapeseed, refined	gal.	.86 @	.90
blown	gal.	.95 @	—
Rosin, first rectified	gal.	.37 @	—
second rectified	gal.	.39 @	—
Tar, commercial	gal.	.31½ @	—
Soya Bean, crude, bbls.	lb.	.09 @	—

Resins and Pitches

Cantella gum	lb.	.50 @	..
Cumar resin	lb.	.09 @	.13
Tar, retort	bbl.	10.50 @	—
kiln burned	bbl.	10.50 @	—
Pitch, Burgundy	lb.	.05 @	.06
coal tar	ton	20.00 @	—
rosin	bbl.	5.85 @	—
Rosin, grade B, ex-yard	bbl.	5.55 @	—
grade K	bbl.	6.45 @	—
Shellac, fine orange	lb.	.90 @	—

Solvents

Acetone, drums, c.p.	lb.	.12½ @	.13
Alcohol, denatured, No. 1	gal.	.40 @	.41
Methyl, 95 per cent, drums	gal.	.60 @	.63
Ethyl, 190 proof, bbls.	gal.	4.70 @	4.80
Benzol, 90 per cent	lb.	.25 @	.30
pure	lb.	.27 @	.40
Carbon bisulphide	lb.	.06 @	.07½
tetrachloride	lb.	.10 @	.12
Dimethylaniline	lb.	.40 @	.45
Naptha, motor gasoline, steel bbls.	gal.	.24 @	—
Talcol, pure drums	gal.	.27 @	.32
Turpentine, spirits	gal	.75 @	—
wood	gal.	.72 @	—
Xylol, pure	gal.	.40 @	.43
commercial	gal.	.28 @	.35

Waxes

Beeswax white, pure	lb.	.38 @	.41
Carnauba, No. 1	lb.	.47 @	.48
Ceresin, white	lb.	.09 @	.10
Bayberry	lb.	.19½ @	.20
Montan, crude	lb.	.04½ @	.05
Ozokerite, hard, pure	lb.	.20 @	.22
Paraffin,	lb.	.08½ @	.08
Petrolatum, amber, bbls.	lb.	.05 @	.05½
dark amber,	lb.	.04½ @	—

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.09 @	.16
Brown	lb.	.11 @	.15
Brown factice	lb.	.07 @	.14
White factice	lb.	.08½ @	.15½
Paragol, soft and medium	cwt.	6.81 @	—
hard	cwt.	6.81 @	—

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.40 @	—
Orange mineral, domestic	lb.	.11 @	.13
Sulphur chloride (jugs)	lb.	.20 @	—
Sulphur flour Brooklyn brand (c.l.)	cwt.	— @	—
Brooklyn brand (l. c. l.)	cwt.	— @	—
Bergenport (c.l.)	cwt.	2.55 @	—
pure soft	cwt.	2.30 @	—
superfine (c. l.	cwt.	2.40 @	2.90

Linseed Oil—There was lively interest in the linseed oil market during the last period; prices eased off to 65 cents and then strengthened to 67 cents at which price a good deal of business was booked. The price early this week rose to 69 cents and at this figure the demand ceased.

Caustic Soda—Such interest from consumers as was noted was confined to less than car load lots and the only feature was that the market continued steady. Standard brands of spot are held at $4.00 @ $4.15.

Soda Ash—The market rules firm with business for less than car load lots reported at $2.15. Business is not lacking and can be done on a quantity basis at a price.

Aniline Oil—A steady amount of small lots are being taken but the effect on the market is inconsequential. Business is being done at 18 cents which figure is considered an inside mark.

Carbon Bisulphide—There has been a steady demand for this item and offerings seem to be scarce. Car load lots are quoted at 6½ cents with smaller quantities quoted upward to 8 cents.

Blanc Fixe—There was some increased interest in this market but not sufficient demand to bring about advanced quotations. Prices were nominally unchanged at 3½ @ 3¾ cents.

Colors—The market for chrome yellows has been somewhat demoralized by cutting and slashing of prices. Raw Umber came a little lower. All in all, however, there was a good tone to the color market and a better feeling.

Lithopone—The foreign material continues to come in but competition with the domestic article has not resulted in any price reduction. Domestic goods continue in high favor without demand quite up to the expectations of the leading producers.

Litharge—The market has been quiet for sometime but no change in prices. Consumption is not nearly up to normal.

Orange Mineral—Producers report that consumers are showing more interest. The improvement such as it is is for the domestic rather than the imported article. Domestic is quoted at 11 @ 13 cents.

Zinc Oxide—The market continues firm as the demand by the tire industry continues along liberal lines. The price of raw material has advanced, consumption increased and a steady improvement in business would mean higher prices. Offerings of imported material are scarce.

Talc—Both imported and domestic held steady. There is plenty of stock on hand of both varieties to take care of all demands. Domestic manufacturers quote from $18.00 to $20.00 a ton.

Whiting—Both the domestic and imported article are moving in a steady volume with prices firm.

Crude Rubber

New York, October 20, 1921

The rubber market continues to be firm and in the last two weeks has advanced two cents a pound and while there have been a few soft spots, in that time, they have seldom lasted through a whole day at any one time. From a high point of 17½ cents the market has reacted to a firm and well maintained position of 17 cents and except for a few odd lots has resisted all attempts to consumate real business below the latter figure.

The volume of business actually done, in the light of normal, has not been great but the fact that with a small turn-over prices advanced so decidedly is indicative of the strong position the market has obtained. London, for the first time in months, reports a decrease of 4000 tons, of spot stocks, in the past two weeks. With Sterling exchange advancing and approximately 25 points higher than two weeks ago and the primary markets at least 1 cent higher than the New York market. Dealers are not inclined to shade prices to obtain business.

Ribbed Smoked Sheets still are at a premium of about ¼ cent over latex. Amber crepes are still strongly held with sales of No. 1 at 16 cents, No. 2 at 15 cents, No. 3 at 14 cents and No. 4 at 13 cents.

Paras are none too freely offered and are firmly held with Up-river Fine reported sold at 22 cents on spot and prompt shipment from Brazil being held at 23 cents.

Current quotations on standard grades are as follows:

Plantations			
Ribbed Smoked Sheets spot	.17	@	.17¼
November	.17	@	.17¼
December	.17¼	@	.17½
Jan./March	.17¾	@	.18
Jan./June	.18½	@	.19
April/June	.19	@	.19½
Smoked sheets plain, spot.	.15	@	.15½
First Latex Pale Crepe, spot	.16¾	@	.17
November	.16¾	@	.17
December	.17	@	.17¼
Jan./March	.17¾	@	.18
Jan./June	.18½	@	.19
April/June	.19	@	.19½
Amber Crepe No. 1	.15½	@	.16
" " " 2	.14½	@	.15
" " " 3	.13½	@	.14
Grand Central Crepe	.14	@	.14½
Clean Thin Brown Crepe	.13¾	@	.14¼
Light Clean Thin Brown	.14½	@	.15
Rolled Brown Crepe	.12½	@	.13
Paras			
Maderia Fine	.23	@	.23½
Acre Fine	.22	@	.22½
Up-river Fine	.21½	@	.22
Up-river Medium	.16	@	.16½
Up-river Caucho	.11½	@	.12
Up-river Coarse	.11	@	.11½
Islands Fine	.18	@	.18½
Islands Coarse	.10	@	.10½
Caucho ball	.11¾	@	.12
Cameta	.09	@	.09½
Xingu Ball	.10	@	.10½
Tapajos fine, spot	.17½	@	.18
Pontianac			
Prime Pressed	.11¼	@	—
Plantation	.06	@	—
Bangermassin	.06¾	@	nom.
Palembang	.09¾	@	—
Gutta Percha Gutta Siak	.15¼	@	—
Prime MaCassar	2.60	@	—
Balata			
Panama Block	.30	@	nom.
Surinam Sheets	.65	@	—
Columbian Block	.41	@	nom.
Venezuelan Block	.54½	@	.55

Scrap Rubber

New York, October 20, 1921

A little activity in boots and shoes is the only feature of an otherwise colorless market. And in this department there is plenty of stock available and prices have not changed.

Quotations are nominally as follows:

Auto tire peelings	.01⅛	@	.01⅜
Standard White auto	.01	@	.01⅛
Mixed auto	.00⅝	@	.00¾
Bicycle tires	.00½	@	.00¾
Solid truck tires	.00¾	@	.01
Boots and Shoes	.03¼	@	.03⅜
Arctics, trimmed	.01⅝	@	.01¾
Arctics, untrimmed	.01⅛	@	.01¼
Inner tubes, No. 1	.03¾	@	.04
Inner tubes, compounded	.02	@	.02¼
Battery jars, black compounded	Nominal		
Batteryjars, No. 1 bright fracture	"		
Inner tubes, red	.02	@	.02⅜
Heels and pads	Nominal		
Black mixed	.00¼	@	—
Garden hose	.00½	@	—
Air brake hose	.00½	@	—
Red packing	.01½	@	.01¾
Red mixed rubber	.02	@	—
White mixed rubber	.01¾	@	—

Reclaimed Rubber

New York, October 20, 1921

Prices continue practically unchanged in this market. Any improvement in the crude rubber market it is felt would have a beneficial effect upon business.

Quotations are nominally as follows:

Standard Reclaims			
Floating	$.12	@	$.13
Friction	.12	@	.13
Boots and Shoes	.10	@	.10½
Boots and Shoes (washed)	.13	@	.14
Mechanical	.08	@	.10
Hose	.10½	@	.11½
Tires, truck	.08	@	.09
Tires, auto	.09	@	.10
White	.13	@	.14

The London Market

A firm tone characterized the London rubber market the last fortnight and prices show a tendency to harden.

The recent advance in the sterling exchange on New York was the chief cause of the quieter market as fresh orders from New York have not been raised to the parity of the higher exchange. At the same time a good inquiry still exists for both spot parcels and forward positions, and deliveries from the London stocks last week were also satisfactory, amounting to 2014 tons, or 705 tons in excess of the landings.

Deliveries for the week ending September 31 were 2014 tons and landings 1309 tons, leaving a stock of 70,929 tons as against 37,052 tons a year ago.

New York Stock Prices

Following are the New York Stock Exchange quotations on the various rubber stocks listed for October 20:

	Bid	Asked
Ajax Rubber Co.	20⅞	21¼
Fisk Rubber Co.	10¾	11¼
B. F. Goodrich Co.	31	31½
do pfd. 7	72	74
Kelly-Springfield Tire Co.	41¼	41⅝
Keystone Tire Co.	10¼	10⅝
Lee Rubber & Tire Co.	27¼	28
U. S. Rubber Co.	48¾	49
do 1st pfd.	87	88
Studebaker Co.	74¼	74⅝
Willys-Overland	5¾	6

Akron Stock Prices

(Special Akron Correspondence)

October brought no decided changes in the market values of rubber shares on the Akron stock market. Goodrich common still holds a point a little above 30, while Goodyear common continues to attract bids around 10. Goodyear preferred is down to 25.

Following are the quotations:

	Bid	Asked
Amer. R. & T. com	30	35
do pfd.	..	85
Amazon Rubber	19	20
Firestone T. & R. com	57	60
do 6 pct. pfd.	82	84
do 7 pct. pfd.	70	73
General T. & R. com	185	210
do 7 pct. pfd.	76	85
B. F. Goodrich com	31½	32½
do 7 pct. pfd.	74	76
do 5 yr. 7 pct. notes	94½	95½
Goodyear T. & R. com	10	10¼
do 7 pct. pfd.	25	25½
Goodyear 8's	103½	104
India Rubber com	65	75
do 8 pct. pfd.	65	75
Mason T. & R. com	8¼	9
do 7 pct. pfd.	47	49
Marathon T. & R. com	2¾	3
Miller Rubber com	50	60
do 8 pct. pfd.	70	75
Mohawk Rubber	70	75
Portage Rubber com	¼	1
do 7 pct. pfd.	1	1½
Republic Rubber com	17c	25c
do 7 pct. pfd.	9	10
do 8 pct. pfd.	..	2½
Rubber Products	40	60
Star Rubber com	..	100
do 8 pct. pfd.	..	100
Swinehart T. & R. com	..	40
do 7 pct. pfd.	..	70
Phoenix Rubber com	..	15
do pfd.	..	90
Standard Tire com	..	100
do pfd.	..	90

American Rubber Patents

1,390,303—To Harvey F. Maranville, Akron, Ohio, assignor to Miller Rubber Co., Akron, Ohio. Air-bag for pneumatic-tire manufacture.

1,390,346—To Elias J. Emery, Lynn, Mass. Resilient heel.

1,390,467—To John O. Smith, Cleveland, Ohio. Vehicle-tire.

1,390,478—To John Malin Arthur, New Woodstock, N. Y., assignor one-half to James W. Arthur, Akron, Ohio. Rubber-shoe-vulcanizing machine.

1,390,599—To David R. Bowen, Ansonia, Conn., assignor to Farrel Foundry & Machine Co., Ansonia, Conn. Rubber-cracker.

1,390,707—To Robert H. Henemier, New York, N. Y., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y. Dust-cap for tire-valves.

1,390,895—To Bruno G. Erler, Oak Lane, Pa., assignor two-fifths to Taylor J. Davidson, Camden, N. J., and three-twentieths to Julius Richter, Philadelphia, Pa. Resilient tire.

1,390,900—To Harry M. Fry, Johnstown, Pa. Tire tread.

1,390,948—To Norman C. Woodward, Hornell, N. Y. Spring-tire.

1,389,590—To William Lumatainen, Albion, Pa. Tire-chain connecting device.

1,389,599—To Arthur J. Savage, San Diego, Cal. Vulcanizer.

1,389,655—To Frederick E. Hafelfinger, Weehawken, N. J. Warning signal for tire deflation.

1,389,729—To William Alderson, Kimberly, South Africa. Wheel and resilient tire for road vehicles.

1,389,766—To George W. C. Lomb, Covington, Ky. Vehicle-tire.

1,389,777—To Catherine D. Mulertz, San Francisco, Cal., assignor one-half to Loyd R. Taylor, Modesto, Cal. Non-skid tire attachment.

1,389,806—To Robert Ambuhl and Marx Teitsch, Troy, N. Y. Tire-filler.

1,389,815—To Reuben F. Corless, College Park, Ga. Inner tube for tires.

1,389,821—To Clarence E. Everett, Milwaukee, Wis. Tire-vulcanizer.

1,389,837—Charles A. Moore, Elizabeth, and David K. Thornton, Roselle Park, N. J. Auto-shoe expanding tool.

1,389,838—To William H. Moore, Pasadena, Cal. Tire-cover.

1,389,870—To Monroe Lyle Henderson, Moore, Mont. Tire-chain.

1,389,892—To Thomas Midgley, Sr., Hampden, Mass., assignor to the Fisk Rubber Co., Chicopee Falls, Mass. Collapsible core.

1,389,960—To Tod J. Mell, Akron, Ohio, assignor to Firestone Tire & Rubber Co., Akron, Ohio. Process of manufacturing tires and apparatus therefor.

New Incorporations

NEW YORK

Porteous Products Co., Inc., to manufacture rubber goods. $25,000. Incorporators: A. G. Porteous, 68 West 128th street, New York; T. L. Woodward, 358 73rd street, Brooklyn; W. R. Chamberlain, 247 Bedford avenue, Mt. Vernon—all in New York.

Royal Tire Co., Inc., to deal in tires and accessories. $10,000. Incorporators: I. Rosenblum, 17 West 108 street; I. Rosenblum, 1519 Benson street; M. Hurenitz, 35 East 110th street—all in New York City.

Solimine Trading Co., to manufacture rubber heels. $60,000. R. Blando, 2 Broadway; W. D. Yankaner, 67 Wall street; both of New York. A. Scodes, 439 Franklin avenue, Brooklyn—all in New York.

Merger Tire and Tube Corporation, to manufacture tires, etc. $500,000. Incorporators: E. H. Sturgeon, C. J. Allen. Attorney, J. S. Knibloe, Buffalo.

Fibre Tire & Rubber Corporation. $3,000,000. Incorporators: Arthur W. Britton, Samuel B. Howard, Robert K. Thistle, New York City. Attorney, U. S. Corporation Co,, New York.

Service Tire & Supply Co. $30,000. Principal office, 215 E. 4th St., New York City. Industrial Rubber Corp. $100,000. Principal office, L. I. City, N. Y.

Unity Utilities Corp., to manufacture rubber heels, soles, etc. $100,000. Incorporators: W. B. Sarelle, 4185 Broadway, New York City.

OHIO

Falor Manufacturing Co., to manufacture inner tubes. $50,000. Incorporators: S. A. Falor, C. T. Schnee, J. C. Grimm, J. Thomas, I. Hill—all of Akron, Ohio. Principal office, 126 West South street, Akron, Ohio.

Forest Tire & Rubber Co., to manufacture cord tires. $5,000. Incorporators: S. J. Gottlieb, A. Z. and M. J. Jaffee, R. H. Bender, V. C. Lynch—all of Cleveland, Ohio. Principal office, 908 Woodlawn avenue, Cleveland, Ohio.

Goliath Rubber Co., to manufacture hard and soft mechanical rubber goods. $50,000. G. Wiken, president; C. W. Koehler, vice president; L. H. Wallace, treasurer; I. S. Fenn, secretary; A. B. Markey, general manager. Principal office, Cleveland, Ohio.

Income Rubber Co., to manufacture tires, tubes, clothing etc. $90,000. Incorporators: C. R. Spahn, M. S. Osborn, E. B. King, A. K. Nier, J. F. Flynn, Jr.—all of Columbus, Ohio.

Quality Rubber Co., to manufacture rubber balloons, surgeons' gloves, etc. $50,000. W. S. Kurtz, president; L. A. Swineford, vice president; F. W. Saltsman, secretary and treasurer—all of Ashland, Ohio. Principal office, 114 Seventh street, Ashland, Ohio.

Stalwart Rubber Co., to manufacture molded and hand made rubber goods. $10,000. Incorporators: H. B. Denman, F. B. Burch, W. Bacon, S. Denlinger, R. H. Miner—all of Cuyahoga Falls..

Mercury Rubber Co. $10,000. Incorporators: Alden C. Fisher and R. S. Worthington—both of Akron.

The Accurate Rubber and Insulation Co. $15,000. Incorporators: F. A. Clarke, C. F. Heinkel, Roy S. A. Burgeson, M. A. Heinkel, L. Brann.

Velcio Tire & Rubber Co. $25,000. Incorporators: Benedict Antoninock & John Velico David G. Frampton, C. A. Harpman and Thomas Bennett. Principal office, Youngstown, Ohio.

Racine Tire and Rubber Company. $50,000. Incorporators: Edward F. Peters, John E. Maloney, J. G. De Fosset and Ralph L. Hinds—all of Cincinnati.

DELAWARE

Henry Tire Corporation, to manufacture and deal in tires. $150,000. Incorporators: E. E. Allison, 130 Convent avenue; C. R. Allison, Marie Antoinette Hotel—New York City. A. K. Dohrmann, 103 Bleeker street, Jersey City, New Jersey. Delaware agent, Capital Trust Co. of Delaware, Dover, Delaware.

Insulation and Specialty Corporation of America, to buy and sell insulating materials. 2500 shares of preferred stock at $100 par value and 2500 shares of common stock, no par. Incorporators: W. L. Broman, P. C. ening, I. L. McIntire—all of Wilmington, Delaware. Principal office, 7 West 10th street, Wilmington, Delaware.

Penn Rubber Products Corporation, to manufacture, buy and sell rubber goods. 50,000 shares of stock, no par. Incorporators: F. R. Hansell, I. V. Punn—Philadelphia, Pennsylvania; E. M. MacFarland, Camden, New Jersey; Delaware agent, Corporation Guarantee & Trust Co., Ford Building, Wilmington, Delaware.

A. Schraders Son of France, to manufacture valves, fittings. $20,000. Incorporators: M. Charles Schweinert, New York; Philip G. Cole, Forest Hills—both of New York; Henry P. Kraft, Ridgewood, N. J. Attorney, Corporation Trust Co. of America.

Climax Heel Co. $10,000. Attorney, Corporation Service Co., Wilmington.

Englert & Englert, tires. $100,000. Attorney, Corporation Trust Co. of America, Wilmington.

Reject Automobile Specialties Co. $50,000. Attorney, Colonial Charter Co. Principal office, Wilmington, Del.

NEW JERSEY

Miles-Steiner Rubber Co., to manufacture mechanical rubber goods. $100,000. J. M. Miller, president; G. W. Page, treasurer, J. D. Steiner, vice president and secretary. Principal office, 678 North Olden Avenue, Trenton, New Jersey.

Tire Service Co., New Brunswick, to deal in automobile tires. $50,000. Incorporators: John A. Smith, James A. Henneney, William F. Drury—all of New Brunswick.

The Howe Rubber Co., to manufacture automobile tires. $4,000,000. John Tenney, Jr., of Plainfield, N. J., president; Ambrose Hardenbergh of New Brunswick, N. J., secretary. Principal office, 134 La Salle street, Chicago, Illinois. Chicago representative, W. T. Alden.

CALIFORNIA

West Court Rubber Corporation, Inc., to manufacture inner tubes. $2,000,000 Incorporators: C. L. Williamson, F. C. Jordan, W. F. Peterson, W. W. Felt, Jr., F. Stanford, J. W. MacClatchie. Principal office, 33 Dolores street, San Francisco.

MARYLAND

Safety First Patch Co., to manufacture rubber specialties. $100,000. Incorporators: G. E. Thrall, H. T. Aldrich, both of 320 South Patterson Park avenue; H. R. Baker, 1520 Fidelity Building—all of Baltimore, Maryland.

ILLINOIS

Security Rubber and Belting Co., to manufacture rubber belting. $100,000. H. E. Dennie, C. M. Burman, J. W. Mowrey—all of Chicago. Main office, 2837 South La Salle St., Chicago.

MAINE

Union Rubber Co., Inc., to manufacture and deal in all kinds of boots, shoes and rubbers; made wholly or partly from rubber. $450,000. Principal office, Calais, Maine.

TENNESSEE

Roney Tire & Auto Co., to deal in automobile accessories. $10,000. Incorporators: O. B. Roney, C. and E. W. Benz, C. G. Kimbrough—all of Nashville, Tennessee. Principal office, 21st avenue S., Nashville, Tennessee.

TEXAS

The Bear Rubber Mills Corporation. $1,000,000. Principal office, San Antonio, Texas.

Capital Increase

Merritt Rubber Co., New York, N. Y. $10,000 to $20,000.

The Barva Heel & Tire Factory of Fort Wayne, Indiana from $50,000 to $100,000. Name also changed to the Wedge Heel & Rubber Company. Officers: B. R. Barva, president; I. B. Franke, vice president; F. F. Wichman, secretary-treasurer.

Dissoultion

Bergougnan Tire Co., New York, N. Y.